		Company 1		Company 2		Company 3		Company 4		Company 5	
Parameter	Basic assumption set	Rel.8	Beyond Rel.8	Rel.8	Beyond Rel.8	Rel.8	Beyond Rel.8 reference	Rel.8	Beyond Rel.8	Rel.8	Beyond Rel.8
Deployment scenario	• Indoor hotspot • Urban micro-cell • Urban macro-cell • Rural macro-cell Parameters and assumptions not shown here for each scenario are shown in ITU guidelines [ITU-R Report M.2135].	Aligned with guidelines	Aligned with guidelines	Aligned with guidelines	Aligned with guidelines	Aligned with guidelines		Aligned with guidelines	Aligned with guidelines	Aligned with guidelines	Aligned with guidelines
Duplex method and bandwidths	FDD: 10+10 MHz except Indoor hotspot with 20+20 MHz TDD: 20 MHz also 40 MHz in indoor Baseline asymmetry during 5 subframes period: 3 Full DL subframes, Special subframe: DwPTS 11sy mbol, GP 1 sy mbol, UpPTS 2 sy mbol, 1 Full UL subframes Alternative special subframe configurations may be used if stated.	Aligned with guidelines	Aligned with guidelines	Aligned with guidelines VoIP FDD: 5+5MHz VoIP TDD:10MHz	Aligned with guidelines VoIP FDD: 5+5MHz VoIP TDD:10MHz			Aligned with guidelines VoIP FDD: 5+5MHz VoIP TDD:10MHz	Aligned with guidelines VoIP FDD: 5+5MHz VoIP TDD:10MHz	Aligned with guidelines	Aligned with guidelines
Network synchronization	Synchronized	Synchronized	Synchronized	Synchronized	Synchronized	Synchronized		Synchronized	Synchronized	Synchronized	Synchronized
Handover margin	1.0 dB	1.0 dB	1.0 dB	1.0 dB	1.0 dB	1dB		1.0 dB	1.0 dB	1.0 dB	1.0 dB
Downlink transmission scheme	Baseline transmission scheme (LTE Rel.8) • MIMO closed loop precoded spatial multiplexing (transmission mode 4 [36.213]) Baseline: 4x2 MIMO • MIMO single stream beamforming (transmission mode 7 [36.213]) Advanced scheme (LTE-A) • MU-MIMO without coordination • MU-MIMO with intercell coordination (= Coordinated scheduling/Beamforming (CS/CB)-CoMP) • Joint processing (JP)-CoMP (SU-MIMO is possible for all cases.)	Aligned with guidelines	MU-MIMO without coordination; Joint processing CoMP	SU-MIMO, with rank adaptation, antenna a) and c) SU-MIMO Based on SRS, rank=1, antenna e)	JP within 3 cells as a cluster, Short term CSI, antenna c) MU-MIMO Based on SRS, rank=1 for each user, antenna e) MU-MIMO Based on SRS with Coordination, rank=1 for each user, antenna e)	Aligned with guidelines	MU-MIMO with coordination within site. No inter-site coordination.	SU-MIMO, with rank adaptation, antenna a) and c) SU-MIMO Based on SRS, rank=1, antenna e)	MU-MIMO Based on SRS with Coordination antenna e)	Aligned with guidelines	MU-MIMO based on short-term narrow-band CSI. For single-cell, configuration (a), (c) is used for 4Tx while (e) is used for 8Tx. MU CoMP JP within up to 3 cells from the same cell site, short term narrow-band CSI, antenna configuration (a) with 4Tx is used.
Downlink scheduler	For baseline transmission scheme (LTE Rel.8): • Proportional fair in time and frequency For advanced transmission scheme (LTE-A) • Aligned with transmission scheme	Proportional fair	Proportional fair	PF	PF	Channel dependent		PF	PF	PF	PF
Downlink link adaptation	Non-ideal based on non-ideal CQI/PMI/RI reports and/or non-ideal sounding transmission, reporting mode and period selected according to scheduler and MIMO transmission schemes; reporting delay and MCS based on LTE transport formats according to [36.213]. Baseline: A) Non-frequency selective PMI and frequency selective CQI report with 5ms periodicity, subband CQI with measurement error: N(0,1) per PRB B) Sounding-based precoding, frequency selective CQI report with 5ms periodicity , subband CQI with measurement error: N(0,1) per PRB	Non-ideal; type A) CQI: 4ms delay 5ms period;PUSCH-based feedback, mode 3-1, wideband PMI CQI measurement error:N(0,1dB) per half-PRB.	Non-ideal; type A) for FDD, type B) for TDD CQI: 4ms delay 10ms period; PUCCH-based feedback,sub-band PMI with 5PRBs.	Aligned with guidelines	Aligned with guidelines	Aligned with guidelines		Aligned with guidelines	Aligned with guidelines	Aligned with baseline (A)	**MU-MIMO**: Dynamic MU- or SU- selection based on the PF metric. Applicable to both single-cell and COMP. Up to 2 Users paired in one PRB, each with rank-1 transmission. **(UMi)** CSI feedback period: 5ms, Minimum control delay: 6ms **(UMa)** CSI feedback period: 2ms, Minimum control delay: 3ms **CoMP**: Dynamic transmission point selection, up to 3 cells within the same cell site. CSI feedback period: 2ms, Minimum control delay: 3ms
CSI assumption at eNB	Report the CSI assumption as described in R1-092977	No CSI for RB	Ref. to R1-092977, short-term and/or narrowband channel state information with non-ideal channel estimation and feedback delay.		Short Term		Long-term wideband transmit channel covariance matrix		Short Term		Short Term, narrowband CSI
Downlink HARQ scheme	Incremental redundancy or Chase combining	IR	CC	CC	CC	IR		CC	CC	IR	IR
Downlink receiver type	Baseline scheme • MMSE Advanced scheme • MMSE-SIC, MLD based receiver Each company should report a description on interference rejection and cancellation capabilities.	MMSE	MMSE	MMSE	MMSE	MMSE with intercell interference rejection capabilities		MMSE	MMSE	MMSE	MMSE
Uplink transmission scheme	Baseline transmission scheme (LTE Rel.8) • SIMO with and without MU-MIMO Baseline: 1 x 4 SIMO Advanced transmission scheme (LTE-A) • SU-MIMO • UL CoMP	1x4 SIMO without MU-MIMO	1x4 CoMP; 2x4 SU-MIMO and CoMP	MU-MIMO with LMMSE detection, antenna e) SIMO with LMMSE detection, antenna a), c), e)		1x4 with and without MU-MIMO		1x4 without MU-MIMO antenna a)		1x4 SIMO without MU-MIMO	
Uplink scheduler	Channel dependent	Proportional fair	Proportional fair	PF	PF	Channel dependent		PF	PF	Proportional fair	
Uplink Power control	Baseline • Fractional power control. Alternative • Other Rel.8 specified Power control parameters (P0 and alpha) are chosen according to the deployment scenario. (NoT reported with simulation results.)	Fractional power control,alpha = 0.8, P0 fitted to the environment (IoT reported with simulation results.)	Fractional power control,alpha = 0.8, P0 fitted to the environment.	alpha = 0.8, P0 fitted to the environment, Target Average IoT <= 10dB	alpha = 0.8, P0 fitted to the environment, Target Average IoT <= 10dB	P0 and alpha fitted to the environment		alpha = 0.8, P0 fitted to the environment, Target Average IoT <= 10dB	alpha = 0.8, P0 fitted to the environment, Target Average IoT <= 10dB	Fractional power control,alpha = 0.8, P0 fitted to the environment (IoT reported with simulation results.)	
Uplink link adaptation	Non-ideal based on delayed SRS-based measurements: MCS based on LTE transport formats and SRS period and bandwidths according to [36.213].	Aligned with guidelines	Aligned with guidelines	Aligned with guidelines	Aligned with guidelines	Aligned with guidelines		Aligned with guidelines	Aligned with guidelines	Aligned with guidelines	
Uplink HARQ scheme	• Incremental redundancy or • Chase combining	IR	CC	CC	CC	IR		CC	CC	IR	
Uplink receiver type	• MMSE or • MMSE-SIC (MU-MIMO)	MMSE	MMSE	MMSE	MMSE	MMSE with intercell interference rejection capabilities		MMSE	MMSE	MMSE	
Antenna configuration base station	Baseline: 4 or 8 Tx antennas with the following configurations: A) Uncorrelated co-polarized: Co-polarized antennas separated 4 wavelengths (illustration for 4 Tx: | | | |) B) Grouped co-polarized: Two groups of co-polarized antennas, 10 wavelengths between center of each group. 0.5 wavelength separation within each group (illustration for 4 Tx: || ||) C) Correlated co-polarized: 0.5 wavelengths between antennas (illustration for 4 Tx: |||) D) Uncorrelated cross-polarized: Columns with +-45deg linearly polarized antennas Columns separated 4 wavelengths (illustration for 4 Tx: X X) E) Correlated cross-polarized Columns with +-45deg linearly polarized antennas Columns separated 0.5 wavelengths (illustration for 8Tx: XXXX)	• Indoor Hotspot: A, C, E • Urban Micro: A, C, E • Urban Macro: A, C, E • Rural Macro: A, C, E	For DL: Urban Micro/Macro:C; For UL: • All scenario: A	Configurations a)-c) evaluated for indoor environment Configurations a)-c) evaluated for all outdoor environments	Configurations a)-c) evaluated for indoor environment Configurations a)-c) evaluated for all outdoor environments	According to baseline mappings		Indr: a) c) Umi: a) c) e) Uma: a) c) e) RMa: a) c) e)	Indr: a) c) Umi: a) c) e) Uma: a) c) e) RMa: a) c) e)	For downlink, • Indoor hotspot: (A) • Urban micro-cell: (A), (B), (C) • Urban macro-cell: (A), (C) • Rural macro-cell: (A), (C) For uplink, • Indoor hotspot: (A), (C) • Urban micro-cell: (A), (C) • Urban macro-cell: (A), (C) • Rural macro-cell: (A), (C)	Configurations (a) for 4Tx, and (e) for 8Tx; evaluated for UMa and UMi
Antenna configuration UE	Baseline: • Vertically polarized antennas with 0.5 wavelengths separation at UE Alternative • Columns with linearly polarized orthogonal antennas with 0.5 wavelengths spacing between columns	Vertically polarized antennas with 0.5 wavelengths separation at UE	Vertically polarized antennas with 0.5 wavelengths separation at UE	Vertically polarized	Vertically polarized	Vertically polarized with 0.5 wavelengths separation for BS antenna configurations A-C, cross polarized for BS antenna configurations D-E		Vertically polarized	Vertically polarized	Vertically polarized antennas with 0.5 wavelengths separation at UE	Vertically polarized
Channel estimation (Uplink and downlink)	Recommended: Non-ideal (For non-ideal case, consider both estimation errors both for demodulation reference signals and sounding reference signals)	Non-ideal;	Non-ideal. For DL TDD beamforming mode ,use SRS for channel estimation with 5ms SRS period and .4 ms delay.	Non-ideal channel estimation	Non-ideal channel estimation	Non-ideal		Non-ideal channel estimation	Non-ideal channel estimation	Non-ideal	Channel estimation error modeled
Control channel and reference signal overhead, Acknowledgements etc.	For baseline transmission (LTE) schemes: Downlink • Overhead for CRS and antenna port 5 according to DL transmission schemes • Overhead for DL CCH of X OFDM symbols (X=1 or 2 or 3) • Overhead for SCH/BCH Uplink • SRS overhead according to UL (and DL) scheduler and transmission scheme • Overhead for UL CCH according to CQI/PMI reporting mode and periodicity used for DL simulation for the same scenario For advanced transmission schemes (LTE-A): Downlink • Overhead assuming 6 MBSFN subframes per DL radio frame (FDD), 2 MBSFN subframes per DL radio frame (TDD) • Overhead for DL CCH of X OFDM symbols (X=1 or 2 or 3) • Overhead for CRS with 1 antenna port • DL overhead for additional DRS • Overhead for SCH/BCH Uplink • UL overhead for CSI feedback and SRS transmission according to transmission scheme factored into the uplink results for the same scenarios. • DL overhead for additional DRS	**FDD:** DL overhead: Aligned with guidelines UL overhead: 6 PRBs for feedback (ACK/NAK, CQI, PMI), 2 sy mbols DMRSs per subframe, and 1 sy mbol SRS per 5ms radio frame; **TDD:** DL overhead: Aligned with guidelines UL overhead: 6 PRBs for feedback (ACK/NAK, CQI, PMI), 2 sy mbols DMRSs per subframe, and 2 sy mbol SRS per 5ms radio frame; DL Spectral efficiency: $\frac{\text{Throughput}}{BW_{DL}(T_s^{-1}T_{data}/T_s^{-1}T_{sf}-T_{ctrl}/T_s^{-1}T_{sf}-T_{ref}/T_s^{-1}T_{sf})}$ UL Spectral efficiency: $\frac{\text{Throughput}}{BW_{UL}(T_s^{-1}T_{data}/T_s^{-1}T_{sf}-T_{ctrl}/T_s^{-1}T_{sf}-T_{ref}/T_s^{-1}T_{sf})}$	DL overhead: Aligned with guidelines UL overhead: 8 PRBs for PUCCH (ACK/NAK, CQI, PMI)/20MHz 2 OFDM sy mbols for DMRSs per subframe, 2 OFDM sy mbol for UpPTS per 5ms.	DL overhead: Aligned with guidelines UL overhead: 8 PRBs for PUCCH (ACK/NAK, CQI, PMI)/20MHz 2 OFDM sy mbols for DMRSs per subframe, 2 OFDM sy mbol for UpPTS per 5ms.	Downlink: Aligned with guidelines Uplink 4 PRBs for PUCCH SRS (20ms period) PRACH (10ms period) MAC header	Downlink Aligned with guidelines	DL overhead: Aligned with guidelines UL overhead: TDD 6 PRBs for PUCCH (ACK/NAK, CQI, PMI)/20MHz, 2 OFDM symbol for SRS per 5ms. FDD 4 PRBs for PUCCH (ACK/NAK, CQI, PMI), SRS (5ms period)	DL overhead: Aligned with guidelines	For downlink, Aligned with guidelines For uplink, 4 PRBs for PUCCH (ACK/NAK, CQI, PMI) 2 OFDM symbols for DMRSs per subframe,	**Common DL overhead:** Aligned with guidelines **Additional for MU-MIMO:** **UMa:** 4 sets of CSI RS ev ery 2 ms with antenna configuration a), c) 8 sets of CSI RS ev ery 2 ms with antenna configuration e). Density 1RE/port/RB. **UMi:** 4 sets of CSI RS ev ery 5 ms with antenna configuration a), c) 8 sets of CSI RS ev ery 5 ms with antenna configuration e). Density 2RE/port/RB. **Additional for CoMP:** 4 sets of CSI RS ev ery 2 ms. Density 1RE/port/RB CRS overhead includes CRS (in the data region) from all COMP transmission points, applicable to normal subframe.
Feedback and control channel errors	None	None	None	None	None	None		None	None	None	None
Others				DL active ratio for TDD: (14+14+2)/(14+14+14+14+13), DL active ratio for TDD: (14+14+13)/(14+14+14+14+13),GP is not active for both UL and DL; SRS is active for UL	DL active ratio for TDD: (14+14+2)/(14+14+14+14+13), DL active ratio for TDD: (14+14+13)/(14+14+14+14+13),GP is not active for both UL and DL; SRS is active for UL						

	Company 6		Company 7		Company 8		Company 9		Company 10		Company 11	
Parameter	Rel-8	Beyond Rel-8	Rel.8	Beyond Rel.8 reference	Rel.8	Beyond Rel.8	Rel.8	Beyond Rel.8	Rel.8	Beyond Rel.8	Rel.8	Beyond Rel.8 reference
Deployment scenario	Aligned with guidelines	Aligned with guidelines	Aligned with guidelines		Aligned with guidelines	Aligned with guidelines	Aligned with guidelines	Aligned with guidelines	Aligned with guidelines	Aligned with guidelines	Aligned with guidelines	Aligned with guidelines
Duplex method and bandwidths	FDD 10+10 MHz TDD 20 MHz, config 1, DwPTS 12, GP 1, UpPTS 2	FDD 10+10 MHz TDD 20 MHz, config 1, DwPTS 12, GP 1, UpPTS 2					Aligned with guidelines VoIP FDD: 5+5MHz VoIP TDD:10MHz	Aligned with guidelines VoIP FDD: 5+5MHz VoIP TDD:10MHz	Aligned with guidelines	Aligned with guidelines	Aligned with guidelines	Aligned with guidelines
Network synchronization	Synchronized	Synchronized	Synchronized		Synchronized	Synchronized	Synchronized	Synchronized	Synchronized	Synchronized	Synchronized	Synchronized
Handover margin	1 dB	1 dB	1dB		1.0 dB	1.0 dB	1.0 dB	1.0 dB	1.0 dB	1.0 dB	1dB	1dB
Downlink transmission scheme	Aligned with guidelines (mode 4)	MU-MIMO without coordination	Aligned with guidelines	MU-MIMO without coordination within site. No inter-site coordination.	Aligned with guidelines	MU-MIMO without coordination;	SU-MIMO, with rank adaptation, antenna a) and c) SU-MIMO Based on SRS, rank=1, antenna e)	MU-MIMO, rank=1 for each user, antenna c) and e)	Aligned with guidelines	MU-MIMO without coordination.	Aligned with guidelines	MU-MIMO without coordiation; MU-MIMO with inter-cell coordination within dominant interfering cells.
Downlink scheduler	PF	PF	Channel dependent		PF	PF	PF	PF	PF	PF	Channel dependent	Channel dependent
Downlink link adaptation	Aligned with guidelines (10 sub-bands for frequency-selective CQI)	Aligned with guidelines (10 sub-bands for frequency-selective CQI)	Aligned with guidelines		Aligned with guidelines	Aligned with guidelines	Aligned with guidelines	Aligned with guidelines	Aligned with guidelines	Semi-static MU-MIMO with rank-1 per UE. Two users paired in one PRB.	Aligned with guidelines	• Additional rate prediction pilot used to improve MU-MIMO rate prediction accuracy. • Asynchronous HARQ with undecodable packet format for the first transmission. • Overhead accounted.
CSI assumption at eNB		TDD MU-MIMO: short termsounding w/ 5ms periodicity, and frequency selective CQI with 5ms periodicity; Sounding error: complex N(0, 0.1) per subcarrier		Short-term and narrowband channel covariance information with non-ideal channel estimation and feedback delay.		Short Term		Short Term		Rank-1 PMI/CQI feedback: Wideband PMI, narrowband CQI with 6RB subband size, finer CQI granularity than Rel-8. Rel-8 codebook. 6ms feedback delay, 5ms feedback periodicity.		• Option 1: Short-term frequency selective eigen-direction feedback with quantization error modeling. • Option 2: Filtered (Long-term) wideband transmit channel covariance matrix (do not meet requirements in some cases)
Downlink HARQ scheme	CC	CC	IR		IR	IR	CC	CC	CC	CC	IR	IR
Downlink receiver type	MMSE	MMSE	MMSE		MMSE	MMSE	MMSE	MMSE	MMSE	MMSE with interference rejection combining	MMSE	MMSE
Uplink transmission scheme	1x4 SIMO without MU-MIMO		1x4			1x4 SIMO without MU-MIMO	1x4 SIMO, antenna a) c); 1x8 SIMO, antenna e)		1x4 SIMO		SIMO with and without MU-MIMO	2x4 with SU/MU-MIMO
Uplink scheduler	Channel dependent PF		Channel dependent		PF	PF	PF	PF	PF		Channel dependent	Channel dependent
Uplink Power control	P0 and alpha fitted to the environment		P0 and alpha fitted to the environment X2 based overload control		alpha = 0.8, P0 fitted to the environment, Target Average IoT <= 10dB	alpha = 0.8, P0 fitted to the environment, Target Average IoT <= 10dB	alpha = 0.8, P0 fitted to the environment, Target Average IoT <= 10dB	alpha = 0.8, P0 fitted to the environment, Target Average IoT <= 10dB	P0 and alpha fitted to the environment		Closed loop ICIC based on OI	Closed loop ICIC based on OI
Uplink link adaptation	Aligned with guidelines		Aligned with guidelines		Aligned with guidelines	Aligned with guidelines	Aligned with guidelines	Aligned with guidelines	Aligned with guidelines		Aligned with guidelines	Aligned with guidelines
Uplink HARQ scheme	CC		IR		IR	IR	CC	CC	CC		IR	IR
Uplink receiver type	MMSE	MMSE	MMSE		MMSE	MMSE	MMSE	MMSE	MMSE		MMSE	MMSE
Antenna configuration base station	DL: • UMi: A, C, E • UMa: A, C, E • RMa: A UL: • A	DL: • UMi / UMa: C UL: • A	According to baseline mappings		According to baseline mappings	According to baseline mappings	Configurations a) c) evaluated for indoor enviroment Configurations a) c) e) evaluated for all outdoor environments	Configurations c) e) evaluated for all outdoor environments	For downlink, • Indoor hotspot: a) • Urban micro-cell: a), c) • Urban macro-cell: a), c) • Rural macro-cell: a), c) For uplink, a), and c) for all configurations		A and C	A and C
Antenna configuration UE	Aligned with guidelines (vertically polarized)	Aligned with guidelines (vertically polarized) (except for DL in case when eNB has x-pol, in which case UE also has x-pol)	Vertically polarized with 0.5 wavelengths separation for BS antenna configurations A-C, cross polarized for BS antenna configurations D-E.		Vertically polarized	Vertically polarized	Vertically polarized	Vertically polarized	Vertically polarized		Vertically polarized with 0.5 wavelengths	Vertically polarized with 0.5 wavelengths
Channel estimation (Uplink and downlink)	Real	Real channel estimation for TDD	Non-ideal		Non-Ideal.	Non-Ideal.	Non-ideal	Non-ideal	Channel estimation modeled		Non-ideal	Non-ideal
Control channel and reference signal overhead, Acknowledgements etc.	DL overhead Aligned with guidelines UL overhead: 0.214 (4 PRBs for PUCCH, 2 symbols per slot for DMRS)	DL overhead Aligned with guidelines	Downlink: Aligned with guidelines Uplink 4 PRBs for PUCCH	Downlink Aligned with guidelines	DL overhead: Aligned with guidelines UL overhead: 8 PRBs for PUCCH (ACK/NAK, CQI, PMI)/20MHz, 2 OFDM symbols for DMRSs per subframe, 2 OFDM symbol for UpPTS per 5ms.	DL overhead: Aligned with guidelines UL overhead: 8 PRBs for PUCCH (ACK/NAK, CQI, PMI)/20MHz, 2 OFDM symbols for DMRSs per subframe, 2 OFDM symbol for UpPTS per 5ms.	DL overhead: Aligned with guidelines UL overhead: 8 PRBs for PUCCH (ACK/NAK, CQI, PMI)/20MHz, 2 OFDM symbols for DMRSs per subframe, 2 OFDM symbol for UpPTS per 5ms.	DL overhead: Aligned with guidelines UL overhead: 8 PRBs for PUCCH (ACK/NAK, CQI, PMI)/20MHz, 2 OFDM symbols for DMRSs per subframe, 2 OFDM symbol for UpPTS per 5ms.	Downlink: Aligned with guidelines Uplink 4 PRBs for PUCCH SRS (5ms period) MAC header	Downlink:Aligned with guidelines	Downlink: Aligned with guidelines Uplink 6 PRBs for PUCCH SRS (5ms period) PRACH (10ms period) MAC header	Downlink: Aligned with guidelines Uplink 6 PRBs for PUCCH SRS (5ms period) PRACH (10ms period) MAC header
Feedback and control channel errors	None	None	None		None	None	None	None			None	None
Others							UL spectrumefficiency for TDD = UL throughput / (TDD bandwidth * (14+14+2)/(14+14+14+14+13)),DL spectrumefficiency for TDD = DL throughput / (TDD bandwidth * (14+14+11)/(14+14+14+14+13)), GP is not active for both UL and DL; SRS is active for UL.	UL spectrumefficiency for TDD = UL throughput / (TDD bandwidth * (14+14+2)/(14+14+14+14+13)),DL spectrumefficiency for TDD = DL throughput / (TDD bandwidth * (14+14+11)/(14+14+14+14+13)), GP is not active for both UL and DL; SRS is active for UL.				

	Company 12		Company 13		Company 14		Company 15		Company 16		Company 17		Company 18	
Parameter	Rel.8	Beyond Rel.8	Rel.8	Beyond Rel.8	Rel.8	Beyond Rel.8	Rel.8	Beyond Rel.8 reference	Rel.8	Beyond Rel.8 reference	Rel.8	Beyond Rel.8 reference	Rel.8	Beyond Rel.8
Deployment scenario	Aligned with assumptions		Compliant to assumptions	Compliant to assumptions	Aligned with guidelines	Aligned with guidelines	Aligned with guidelines	Aligned with guidelines	Aligned with guidelines		Aligned with guidelines	Aligned with guidelines	• Indoor hotspot • Urban micro-cell • Urban macro-cell • Rural macro-cell Parameters and assumptions not shown here for each scenario are shown in ITU guidelines [ITU-R Report M.2135].	
Duplex method and bandwidths	Aligned with assumptions		Compliant to assumptions	Compliant to assumptions	Aligned with guidelines	Aligned with guidelines			FDD: 10+10 MHz except Indoor hotspot with 20+20 MHz TDD:10MHz		Aligned with guidelines (FDD only)	Aligned with guidelines (FDD only)	FDD: 10+10 MHz except Indoor hotspot with 20+20 MHz	
Network synchronization	Aligned with assumptions		Compliant to assumptions	Compliant to assumptions	Synchronized	Synchronized	Synchronized	Synchronized	Synchronized		Synchronized	Synchronized	Synchronized	
Handover margin	Aligned with assumptions		Compliant to assumptions	Compliant to assumptions	1.0 dB	1.0 dB	1dB	1dB	1.0 dB		1dB	1dB	1.0 dB	
Downlink transmission scheme	4x2 SU-MIMO for antenna setup A 4-Tx BF with up to 3-Beams per cell for antenna setup C, no coordination.		Compliant to assumptions (4x2 SU-MIMO)	Compliant to ReL8 assumptions (4x2 SU-MIMO)	4x2 MIMO closed loop precoding spatial multiplexing	Max 4 UE MU-MIMO without coordination, rank=1 for each user, zero-forcing beamforming, Full-searching for possible UE combinations	Aligned with guidelines	8Tx SU-MIMO	+MIMO closed loop precoded spatial multiplexing transmission mode 4 [36.213]: Baseline: 4x2 MIMO		Aligned with guidelines	MU-MIMO with inter-site coordination	Aligned with guidelines	
Downlink scheduler	Aligned with assumptions		Proportional fair in time and frequency	Proportional fair in time and frequency	PF	PF PF factor 1.2 for Uma channel, PF factor 1.0 for other channels	Channel dependent	Channel dependent	PF		Proportional fair	Proportional fair	PF	
Downlink link adaptation	Aligned with assumptions		Compliant to assumptions	Compliant to assumptions	Wideband PMI and Sub-band(6RB) CQI report with 5ms periodicity, 6ms delay, subband CQI with measurement error: N(0,1) per PRB	Wideband PMI and Sub-band(6RB) CQI report with 5ms periodicity, 6ms delay, subband CQI with measurement error: N(0,1) per PRB	Aligned with guidelines	Aligned with guidelines	Non-ideal based on non-ideal CQI/PMI/RI reports and/or non-ideal sounding transmission, reporting mode and period selected according to scheduler and MIMO transmission schemes; reporting delay and MCS based on LTE transport formats according to [36.213].		Aligned with guidelines - 6 ms delay - Baseline (A)	Aligned with guidelines - 6 ms delay - Baseline (A)	Aligned with guidelines	
CSI assumption at eNB	Rel'8 compliant					Largest eigen vector of long-term wideband transmit channel covariance matrix						Long-term wideband transmit channel covariance matrix	No CSI for R8	
Downlink HARQ scheme	CC		CC	CC	IR	IR	IR		CC		CC	CC	IR	
Downlink receiver type	MMSE		MMSE with intercell interference rejection capabilities	MMSE with cancellation of strongest intercell interfer	MMSE	MMSE	MMSE		MMSE		MMSE with ideal IRC (The case without IRC is also evaluated)	MMSE with ideal IRC	MMSE	
Uplink transmission scheme	1x4 baseline without MU-MIMO for most cases. For Umi TDD: 1x4 with MU-MIMO.		1x4 SIMO w/o MU-MIMO		1x4, no MU-MIMO		1x4 without MU-MIMO		1x4 without MU-MIMO		1x4 SIMO without MU-MIMO	2x4 SU-MIMO 1x4, 2x4 CoMP	Baseline transmission scheme (LTE Rel.8) • SIMO without MU-MIMO Baseline: 1 x 4 SIMO	
Uplink scheduler	Aligned with assumptions		Proportional fair in time and frequency		Channel dependent		Channel dependent		PF		Channel dependent	Channel dependent	Channel dependent	
Uplink Power control	Rel'8 PC with optimized parameter settings		Fractional power control alpha=0.8 for all scenarios P0 are fitted to the environment		Tbs Fractional power control, alpha=1.0 Target IoT = 13dB		P0 and alpha fitted to the environment		alpha = 1 and P0 fitted to the environment		Fractional power control, alpha = 0.8, Indoor hotspot: P0 = -80 dBm Urban micro-cell: P0 = -85 dBm Urban macro-cell: P0 = -83 dBm Rural macro-cell: P0 = -84 dBm	Fractional power control, alpha = 0.8, Indoor hotspot: P0 = -80 dBm Urban micro-cell: P0 = -85 dBm Urban macro-cell: P0 = -83 dBm Rural macro-cell: P0 = -84 dBm	alpha = 0.8, P0 fitted to the environment.Target Average IoT <= 10dB	
Uplink link adaptation	Aligned with assumptions		Compliant to assumptions * SRS periodicity: 5 ms per UE * SRS delay total: 6ms * SRS overhead: 4 subframes/ per frame		Aligned with guidelines		Aligned with guidelines		Aligned with guidelines		Aligned with guidelines	Aligned with guidelines	Non-ideal based on delayed SRS-based measurements: MCS based on LTE transport formats and SRS period and bandwidths accordins to	
Uplink HARQ scheme	CC		CC		IR		IR		CC		CC	CC	IR	
Uplink receiver type	MMSE		MMSE with intercell interference rejection capabilities		MMSE				MMSE		MMSE with IRC for strongest interference	MMSE with IRC for strongest interference	MMSE	
Antenna configuration base station	Antenna Setup A for all cases. Antenna Setup C for Umi and Uma		For DL: Indoor Hotspot: A, C Urban Micro: A, C Urban Macro: A, C Rural Macro: A, C For UL Indoor Hotspot: A Urban Micro: A Urban Macro: A Rural Macro: A	For DL: Urban Micro: A, C Urban Macro: A, C Rural Macro: A, C	Configurations a-c	Configurations c	DL: Configurations a) and c) are evaluated for all environment UL: Configurations a) evaluated for all environment	DL: Configurations a) and c) are evaluated for all environment UL: Configurations a) evaluated for all environment	• Indoor Hotspot: A, B, C • Urban Micro: A, B, C • Urban Macro: A, B, C • Rural Macro: A, B, C		For downlink, • Indoor hotspot: (A) • Urban micro-cell: (C) • Urban macro-cell: (C) • Rural macro-cell: (C) For uplink, • Indoor hotspot: (A) • Urban micro-cell: (A), (C) • Urban macro-cell: (A), (C) • Rural macro-cell: (A), (C)	For downlink, • Indoor hotspot: (A) • Urban micro-cell: (C) • Urban macro-cell: (C) • Rural macro-cell: (C) For uplink, • Indoor hotspot: (A) • Urban micro-cell: (A), (C) • Urban macro-cell: (A), (C) • Rural macro-cell: (A), (C)	Configurations a-c evaluated for all environments	
Antenna configuration UE	Aligned with baseline		Compliant to baseline assumptions	Compliant to baseline assumptions	Vertically polarized		Vertically polarized	Vertically polarized	No vertically polarized antennas, 0.5 wavelengths separation at UE		Vertically polarized antennas with 0.5 wavelengths separation at UE	Vertically polarized antennas with 0.5 wavelengths separation at UE	Vertically polarized	
Channel estimation (Uplink and downlink)	Non-ideal		Non-ideal both for DL and UL	Non-ideal	Real channel estimation	Real channel estimation	SRS for channel estimation with 5ms SRS period and 4 ms delay.	SRS for channel estimation with 5ms SRS period and 4 ms delay.	Non-ideal		Non-ideal	Non-ideal		
Control channel and reference signal overhead, Acknowledgements etc.	Downlink Aligned with guidelines Uplink: 4 PRBs for PUCCH for 10 MHz. 8 PRBs for PUCCH for 20 MHz. SRS overhead: 1 symbol in every 10 TTI for FDD SRS overhead: 1 symbol in UpPTS for TDD UL DRS: 2 out of 14 symbols per TTI	Downlink Aligned with guidelines	DL: Aligned with guidelines UL: - PUCCH: 6 PRBs for Inh, 4 PRBs for UMi/UMa/RMa - DMRS: 2 symbols per subframe - 4 symbol SRS per frame	DL: Aligned with guidelines UL: - PUCCH: 8PRBs for Inh, 4PRBs for UMi/UMa/RMa - DMRS: 2 symbols per subframe - 4 symbol SRS per frame	DL overhead: Aligned with guidelines UL overhead: 4 PRBs for PUCCH /10MHz,	DL overhead: Aligned with guidelines UL overhead: 4 PRBs for PUCCH /10MHz,	DL: Aligned with guidelines UL: 4 PRBs for PUCCH	DL: Aligned with guidelines UL: 4 PRBs for PUCCH	**FDD:** DL overhead Aligned with guidelines UL overhead: 4 PRBs for feedback (ACK/NAK, CQI, PMI), 2 symbols DMRSs per subframe, and 1 symbol SRS per 1m radio frame; **TDD:** DL overhead Aligned with guidelines UL overhead: 4 PRBs for feedback (ACK/NAK, CQI, PMI), 2 symbols DMRSs per subframe, and 1 symbol SRS per 1m radio frame;	DL overhead Aligned with guidelines	Downlink: Aligned with guidelines Uplink: - 4 PRBs for PUCCH - 20 msec period SRS	Downlink: Aligned with guidelines Uplink: - 4 PRBs for PUCCH - 20 msec period SRS	Downlink Aligned with guidelines	Downlink Aligned with guidelines
Feedback and control channel errors	Aligned with assumptions.		None	None	None	None	None	None	None		None	None		
Others														

Deployment scenario	Indoor Hotspot

Downlink L1/L2 control overhead	1 OFDM symbols per subframe

	FDD		Requirement	Company1	Company2	Company3	Company4	Company5	Company6	Company7	Company8	Company9	Company10	Company11	Company12	Company13	Company14	Company15	Company16	Company17
Downlink spectral efficiency	(A) Rel-8 Uncorr	Cell avg	3.0	4.69	4.52	5.16	4.74	4.86		5.55	4.65	4.88	5.12	4.40	4.60	4.44	4.66		5.34	4.42
		Cell-edge	0.1	0.23	0.21	0.24	0.29	0.24		0.25	0.24	0.18	0.25	0.18	0.21	0.15	0.18		0.33	0.21
	(B) Rel-8 Grouped	Cell avg	3.0																5.35	
		Cell-edge	0.1																0.31	
	(C) Rel-8 Corr	Cell avg	3.0	4.70	4.46	3.70	4.78			5.49	4.62	4.40				4.58	4.60		5.08	4.39
		Cell-edge	0.1	0.23	0.21	0.25	0.29			0.26	0.24	0.17				0.17	0.18		0.27	0.20
	(D) Rel-8 X-pol uncorr	Cell avg	3.0							6.58										
		Cell-edge	0.1							0.24										
	(E) Rel-8 X-pol corr	Cell avg	3.0			5.47				6.62										
		Cell-edge	0.1			0.19				0.25										
	(C) MU-MIMO w/o corrdination 4tx	Cell avg	3.0		6.71					6.33							6.84			
		Cell-edge	0.1		0.26					0.25							0.28			
	(A) MU-MIMO w/o corrdination 4tx	Cell avg	3.0							6.33										
		Cell-edge	0.1							0.25										
	(C) MU-MIMO w/o corrdination 8tx	Cell avg	3.0							6.57										
		Cell-edge	0.1							0.24										
	(C) MU-MIMO w. corrdination 4tx	Cell avg	3.0																	
		Cell-edge	0.1																	
	(A) MU-MIMO w. corrdination 4tx	Cell avg	3.0																	
		Cell-edge	0.1																	
	(C) MU-MIMO w. corrdination 8tx	Cell avg	3.0																	
		Cell-edge	0.1																	
	(C) Joint processing CoMP 4tx	Cell avg	3.0																	
		Cell-edge	0.1																	
	(A) Joint processing CoMP 4tx	Cell avg	3.0																	
		Cell-edge	0.1																	
	(C) Joint processing CoMP 8tx	Cell avg	3.0																	
		Cell-edge	0.1																	
	(C) Rel-8 - single-layer BF 8tx	Cell avg	3.0																	
		Cell-edge	0.1																	
	(A) Rel-8 Uncorr + intercell interference canc	Cell avg	3.0																	
		Cell-edge	0.1																	
	(C) Rel-8 Corrr + intercell interference cancel	Cell avg	3.0																	
		Cell-edge	0.1																	
	(A) SU-MIMO 8tx	Cell avg	3.0																	
		Cell-edge	0.1																	
	(C) SU-MIMO 8tx	Cell avg	3.0																	
		Cell-edge	0.1																	

Deployment scenario	Indoor Hotspot

Downlink L1/L2 control overhead	1 OFDM symbols per subframe

	TDD		Requirement	Company1	Company2	Company3	Company4	Company6	Company7	Company8	Company9	Company12	Company16	Company11
Downlink spectral efficiency	(A) Rel-8 Uncorr	Cell avg	3.0	4.43	4.53	5.09	4.20		4.90	4.52	4.90	4.49	5.39	4.44
		Cell-edge	0.1	0.22	0.21	0.22	0.25		0.22	0.21	0.17	0.20	0.31	0.18
	(B) Rel-8 Grouped	Cell avg	3.0										5.40	
		Cell-edge	0.1										0.33	
	(C) Rel-8 Corr	Cell avg	3.0	4.44	4.46	3.71	4.27		4.77	4.52	4.40		5.20	
		Cell-edge	0.1	0.21	0.21	0.22	0.25		0.22	0.20	0.16		0.30	
	(D) Rel-8 X-pol uncorr	Cell avg	3.0											
		Cell-edge	0.1											
	(E) Rel-8 X-pol corr	Cell avg	3.0			5.39			6.09					
		Cell-edge	0.1			0.17			0.24					
	(C) MU-MIMO w/o corrdination 4tx	Cell avg	3.0		6.77				6.05	6.97	6.95			
		Cell-edge	0.1		0.27				0.22	0.26	0.21			
	(A) MU-MIMO w/o corrdination 4tx	Cell avg	3.0											
		Cell-edge	0.1											
	(C or E) MU-MIMO w/o corrdination 8tx	Cell avg	3.0						6.23					
		Cell-edge	0.1						0.24					
	(C) MU-MIMO w. corrdination 4tx	Cell avg	3.0											
		Cell-edge	0.1											
	(A) MU-MIMO w. corrdination 4tx	Cell avg	3.0											
		Cell-edge	0.1											
	(C or E) MU-MIMO w. corrdination 8tx	Cell avg	3.0											
		Cell-edge	0.1											
	(C) Joint processing CoMP 4tx	Cell avg	3.0											
		Cell-edge	0.1											
	(A) Joint processing CoMP 4tx	Cell avg	3.0											
		Cell-edge	0.1											
	(C or E) Joint processing CoMP 8tx	Cell avg	3.0											
		Cell-edge	0.1											
	(C or E) Rel-8 - single-layer BF 8tx	Cell avg	3.0											
		Cell-edge	0.1											
	(A) Rel-8 Uncorr + intercell interference canceller	Cell avg	3.0											
		Cell-edge	0.1											
	(C) Rel-8 Corrr + intercell interference canceller	Cell avg	3.0											
		Cell-edge	0.1											
	(A) SU-MIMO 8tx	Cell avg	3.0											
		Cell-edge	0.1											
	(C) SU-MIMO 8tx	Cell avg	3.0											
		Cell-edge	0.1											

Deployment scenario	Indoor Hotspot

Downlink L1/L2 control overhead	2 OFDM symbols per subframe

	FDD		Requirement	Company1	Company2	Company3	Company4	Company5	Company6	Company7	Company8	Company9	Company10	Company11	Company12	Company13	Company14	Company15	Company16	Company17
Downlink spectral efficiency	(A) Rel-8 Uncorr	Cell avg	3.0	4.41	4.25	4.86	4.46	4.57		5.22	4.37	4.59	4.81	4.14	4.33	4.18	4.38		5.02	4.16
		Cell-edge	0.1	0.22	0.20	0.23	0.27	0.22		0.24	0.23	0.17	0.23	0.17	0.20	0.14	0.17		0.31	0.19
	(B) Rel-8 Grouped	Cell avg	3.0																5.03	
		Cell-edge	0.1																0.29	
	(C) Rel-8 Corr	Cell avg	3.0	4.42	4.20	3.48	4.50			5.16	4.35	4.14				4.31	4.33		4.78	4.13
		Cell-edge	0.1	0.21	0.20	0.23	0.27			0.24	0.22	0.16				0.16	0.17		0.26	0.19
	(D) Rel-8 X-pol uncorr	Cell avg	3.0							6.19										
		Cell-edge	0.1							0.23										
	(E) Rel-8 X-pol corr	Cell avg	3.0			5.15				6.23										
		Cell-edge	0.1			0.18				0.23										
	(C) MU-MIMO w/o corrdination 4tx	Cell avg	3.0		6.14					5.79							6.25			
		Cell-edge	0.1		0.24					0.23							0.26			
	(A) MU-MIMO w/o corrdination 4tx	Cell avg	3.0							5.79										
		Cell-edge	0.1							0.23										
	(C) MU-MIMO w/o corrdination 8tx	Cell avg	3.0							6.01										
		Cell-edge	0.1							0.22										
	(C) MU-MIMO w. corrdination 4tx	Cell avg	3.0																	
		Cell-edge	0.1																	
	(A) MU-MIMO w. corrdination 4tx	Cell avg	3.0																	
		Cell-edge	0.1																	
	(C) MU-MIMO w. corrdination 8tx	Cell avg	3.0																	
		Cell-edge	0.1																	
	(C) Joint processing CoMP 4tx	Cell avg	3.0																	
		Cell-edge	0.1																	
	(A) Joint processing CoMP 4tx	Cell avg	3.0																	
		Cell-edge	0.1																	
	(C) Joint processing CoMP 8tx	Cell avg	3.0																	
		Cell-edge	0.1																	
	(C) Rel-8 - single-layer BF 8tx	Cell avg	3.0																	
		Cell-edge	0.1																	
	(A) Rel-8 Uncorr + intercell interference canc	Cell avg	3.0																	
		Cell-edge	0.1																	
	(C) Rel-8 Corrr + intercell interference cancel	Cell avg	3.0																	
		Cell-edge	0.1																	
	(A) SU-MIMO 8tx	Cell avg	3.0																	
		Cell-edge	0.1																	
	(C) SU-MIMO 8tx	Cell avg	3.0																	
		Cell-edge	0.1																	

Deployment scenario	Indoor Hotspot

Downlink L1/L2 control overhead	2 OFDM symbols per subframe

	TDD		Requirement	Company1	Company2	Company3	Company4	Company6	Company7	Company8	Company9	Company12	Company16	Company11
Downlink spectral efficiency	(A) Rel-8 Uncorr	Cell avg	3.0	4.15	4.24	4.76	3.93		4.59	4.23	4.58	4.20	5.03	4.15
		Cell-edge	0.1	0.21	0.19	0.20	0.23		0.20	0.20	0.16	0.19	0.29	0.17
	(B) Rel-8 Grouped	Cell avg	3.0										5.06	
		Cell-edge	0.1										0.30	
	(C) Rel-8 Corr	Cell avg	3.0	4.16	4.17	3.47	4.00		4.46	4.23	4.11		4.87	
		Cell-edge	0.1	0.20	0.19	0.21	0.23		0.21	0.19	0.15		0.28	
	(D) Rel-8 X-pol uncorr	Cell avg	3.0											
		Cell-edge	0.1											
	(E) Rel-8 X-pol corr	Cell avg	3.0			5.04			5.70					
		Cell-edge	0.1			0.16			0.23					
	(C) MU-MIMO w/o corrdination 4tx	Cell avg	3.0		6.14				5.48	6.32	6.31			
		Cell-edge	0.1		0.24				0.20	0.24	0.19			
	(A) MU-MIMO w/o corrdination 4tx	Cell avg	3.0											
		Cell-edge	0.1											
	(C or E) MU-MIMO w/o corrdination 8tx	Cell avg	3.0						5.65					
		Cell-edge	0.1						0.22					
	(C) MU-MIMO w. corrdination 4tx	Cell avg	3.0											
		Cell-edge	0.1											
	(A) MU-MIMO w. corrdination 4tx	Cell avg	3.0											
		Cell-edge	0.1											
	(C or E) MU-MIMO w. corrdination 8tx	Cell avg	3.0											
		Cell-edge	0.1											
	(C) Joint processing CoMP 4tx	Cell avg	3.0											
		Cell-edge	0.1											
	(A) Joint processing CoMP 4tx	Cell avg	3.0											
		Cell-edge	0.1											
	(C or E) Joint processing CoMP 8tx	Cell avg	3.0											
		Cell-edge	0.1											
	(C or E) Rel-8 - single-layer BF 8tx	Cell avg	3.0											
		Cell-edge	0.1											
	(A) Rel-8 Uncorr + intercell interference canceller	Cell avg	3.0											
		Cell-edge	0.1											
	(C) Rel-8 Corrr + intercell interference canceller	Cell avg	3.0											
		Cell-edge	0.1											
	(A) SU-MIMO 8tx	Cell avg	3.0											
		Cell-edge	0.1											
	(C) SU-MIMO 8tx	Cell avg	3.0											
		Cell-edge	0.1											

Deployment scenario	Indoor Hotspot

Downlink L1/L2 control overhead	3 OFDM symbols per subframe

	FDD		Requirement	Company1	Company2	Company3	Company4	Company5	Company6	Company7	Company8	Company9	Company10	Company11	Company12	Company13	Company14	Company15	Company16	Company17
Downlink spectral efficiency	(A) Rel-8 Uncorr	Cell avg	3.0	3.99	3.85	4.40	4.04	4.14		4.72	3.96	4.15	4.36	3.75	3.92	3.79	3.97		4.55	3.76
		Cell-edge	0.1	0.20	0.18	0.20	0.24	0.20		0.22	0.21	0.15	0.21	0.15	0.18	0.13	0.15		0.28	0.18
	(B) Rel-8 Grouped	Cell avg	3.0																4.56	
		Cell-edge	0.1																0.27	
	(C) Rel-8 Corr	Cell avg	3.0	4.00	3.80	3.15	4.07			4.67	3.94	3.74				3.90	3.92		4.33	3.74
		Cell-edge	0.1	0.19	0.18	0.21	0.24			0.22	0.20	0.14				0.14	0.16		0.23	0.17
	(D) Rel-8 X-pol uncorr	Cell avg	3.0							5.60										
		Cell-edge	0.1							0.21										
	(E) Rel-8 X-pol corr	Cell avg	3.0			4.66				5.64										
		Cell-edge	0.1			0.16				0.21										
	(C) MU-MIMO w/o corrdination 4tx	Cell avg	3.0		5.57					5.25							5.66			
		Cell-edge	0.1		0.22					0.20							0.23			
	(A) MU-MIMO w/o corrdination 4tx	Cell avg	3.0							5.25										
		Cell-edge	0.1							0.21										
	(C) MU-MIMO w/o corrdination 8tx	Cell avg	3.0							5.45										
		Cell-edge	0.1							0.20										
	(C) MU-MIMO w. corrdination 4tx	Cell avg	3.0																	
		Cell-edge	0.1																	
	(A) MU-MIMO w. corrdination 4tx	Cell avg	3.0																	
		Cell-edge	0.1																	
	(C) MU-MIMO w. corrdination 8tx	Cell avg	3.0																	
		Cell-edge	0.1																	
	(C) Joint processing CoMP 4tx	Cell avg	3.0																	
		Cell-edge	0.1																	
	(A) Joint processing CoMP 4tx	Cell avg	3.0																	
		Cell-edge	0.1																	
	(C) Joint processing CoMP 8tx	Cell avg	3.0																	
		Cell-edge	0.1																	
	(C) Rel-8 - single-layer BF 8tx	Cell avg	3.0																	
		Cell-edge	0.1																	
	(A) Rel-8 Uncorr + intercell interference canc	Cell avg	3.0																	
		Cell-edge	0.1																	
	(C) Rel-8 Corrr + intercell interference cancel	Cell avg	3.0																	
		Cell-edge	0.1																	
	(A) SU-MIMO 8tx	Cell avg	3.0																	
		Cell-edge	0.1																	
	(C) SU-MIMO 8tx	Cell avg	3.0																	
		Cell-edge	0.1																	

Deployment scenario	Indoor Hotspot

Downlink L1/L2 control overhead	3 OFDM symbols per subframe

	TDD		Requirement	Company1	Company2	Company3	Company4	Company6	Company7	Company8	Company9	Company12	Company16	Company11
Downlink spectral efficiency	(A) Rel-8 Uncorr	Cell avg	3.0	3.86	3.95	4.43	3.66		4.27	3.94	4.27	3.91	4.69	3.87
		Cell-edge	0.1	0.19	0.18	0.19	0.22		0.19	0.18	0.15	0.17	0.27	0.15
	(B) Rel-8 Grouped	Cell avg	3.0										4.71	
		Cell-edge	0.1										0.28	
	(C) Rel-8 Corr	Cell avg	3.0	3.87	3.89	3.24	3.72		4.16	3.94	3.83		4.53	
		Cell-edge	0.1	0.19	0.18	0.20	0.22		0.19	0.17	0.14		0.26	
	(D) Rel-8 X-pol uncorr	Cell avg	3.0											
		Cell-edge	0.1											
	(E) Rel-8 X-pol corr	Cell avg	3.0			4.70			5.31					
		Cell-edge	0.1			0.15			0.21					
	(C) MU-MIMO w/o corrdination 4tx	Cell avg	3.0		5.72				5.11	5.89	5.87			
		Cell-edge	0.1		0.22				0.19	0.22	0.18			
	(A) MU-MIMO w/o corrdination 4tx	Cell avg	3.0											
		Cell-edge	0.1											
	(C or E) MU-MIMO w/o corrdination 8tx	Cell avg	3.0						5.26					
		Cell-edge	0.1						0.20					
	(C) MU-MIMO w. corrdination 4tx	Cell avg	3.0											
		Cell-edge	0.1											
	(A) MU-MIMO w. corrdination 4tx	Cell avg	3.0											
		Cell-edge	0.1											
	(C or E) MU-MIMO w. corrdination 8tx	Cell avg	3.0											
		Cell-edge	0.1											
	(C) Joint processing CoMP 4tx	Cell avg	3.0											
		Cell-edge	0.1											
	(A) Joint processing CoMP 4tx	Cell avg	3.0											
		Cell-edge	0.1											
	(C or E) Joint processing CoMP 8tx	Cell avg	3.0											
		Cell-edge	0.1											
	(C or E) Rel-8 - single-layer BF 8tx	Cell avg	3.0											
		Cell-edge	0.1											
	(A) Rel-8 Uncorr + intercell interference canceller	Cell avg	3.0											
		Cell-edge	0.1											
	(C) Rel-8 Corrr + intercell interference canceller	Cell avg	3.0											
		Cell-edge	0.1											
	(A) SU-MIMO 8tx	Cell avg	3.0											
		Cell-edge	0.1											
	(C) SU-MIMO 8tx	Cell avg	3.0											
		Cell-edge	0.1											

Deployment scenario	Urban Micro-cell

Downlink L1/L2 control overhead	1 OFDM symbols per subframe

	FDD		Requirement	Company1	Company2	Company3	Company4	Company5	Company6	Company7	Company8	Company9	Company10	Company11	Company12	Company13	Company14	Company15	Company16	Company17
Downlink spectral efficiency	(A) Rel-8 Uncorr	Cell avg	2.6																	
		Cell-edge	0.075																	
	(B) Rel-8 Grouped	Cell avg	2.6																	
		Cell-edge	0.075																	
	(C) Rel-8 Corr	Cell avg	2.6																	
		Cell-edge	0.075																	
	(D) Rel-8 X-pol uncorr	Cell avg	2.6																	
		Cell-edge	0.075																	
	(E) Rel-8 X-pol corr	Cell avg	2.6																	
		Cell-edge	0.075																	
	(C) MU-MIMO w/o corrdination 4tx	Cell avg	2.6	3.24	3.38		4.13	3.67		3.38			3.60	3.60			3.31			
		Cell-edge	0.075	0.10	0.10		0.10	0.09		0.12			0.10	0.13			0.10			
	(A) MU-MIMO w/o corrdination 4tx	Cell avg	2.6					3.89		3.06				3.24						
		Cell-edge	0.075					0.13		0.12				0.11						
	(C) MU-MIMO w/o corrdination 8tx	Cell avg	2.6	4.60				4.61		3.56		3.97								
		Cell-edge	0.075	0.18				0.17		0.15		0.11								
	(C) MU-MIMO w. corrdination 4tx	Cell avg	2.6			3.43							3.54	3.65	3.88					3.41
		Cell-edge	0.075			0.11							0.10	0.14	0.10					0.09
	(A) MU-MIMO w. corrdination 4tx	Cell avg	2.6											3.31						
		Cell-edge	0.075											0.13						
	(C) MU-MIMO w. corrdination 8tx	Cell avg	2.6			4.81	4.00													
		Cell-edge	0.075			0.13	0.12													
	(C) Joint processing CoMP 4tx	Cell avg	2.6	4.46																
		Cell-edge	0.075	0.14																
	(A) Joint processing CoMP 4tx	Cell avg	2.6																	
		Cell-edge	0.075																	
	(C) Joint processing CoMP 8tx	Cell avg	2.6																	
		Cell-edge	0.075																	
	(C) Rel-8 - single-layer BF 8tx	Cell avg	2.6																	
		Cell-edge	0.075																	
	(A) Rel-8 Uncorr + intercell interference canceller	Cell avg	2.6													3.54				
		Cell-edge	0.075													0.10				
	(C) Rel-8 Corrr + intercell interference canceller	Cell avg	2.6													3.75				
		Cell-edge	0.075													0.10				
	(A) SU-MIMO 8tx	Cell avg	2.6																	
		Cell-edge	0.075																	
	(C) SU-MIMO 8tx	Cell avg	2.6																	
		Cell-edge	0.075																	

Deployment scenario	**Urban Micro-cell**

Downlink L1/L2 control overhead	**1 OFDM symbols per subframe**

	TDD		**Requirement**	Company1	Company2	Company3	Company4	Company6	Company7	Company8	Company9	Company12	Company16	Company11
Downlink spectral efficiency	(A) Rel-8 Uncorr	Cell avg	2.6											
		Cell-edge	0.075											
	(B) Rel-8 Grouped	Cell avg	2.6											
		Cell-edge	0.075											
	(C) Rel-8 Corr	Cell avg	2.6											
		Cell-edge	0.075											
	(D) Rel-8 X-pol uncorr	Cell avg	2.6											
		Cell-edge	0.075											
	(E) Rel-8 X-pol corr	Cell avg	2.6											
		Cell-edge	0.075											
	(C) MU-MIMO w/o corrdination 4tx	Cell avg	2.6	3.51	3.69		3.69	3.05	3.26	3.87	3.45			3.52
		Cell-edge	0.075	0.11	0.10		0.09	0.08	0.12	0.11	0.10			0.13
	(A) MU-MIMO w/o corrdination 4tx	Cell avg	2.6											3.22
		Cell-edge	0.075											0.11
	(C or E) MU-MIMO w/o corrdination 8tx	Cell avg	2.6	4.75	4.16					4.00	4.08			
		Cell-edge	0.075	0.13	0.11					0.12	0.11			
	(C) MU-MIMO w. corrdination 4tx	Cell avg	2.6		3.94	3.32						3.61		
		Cell-edge	0.075		0.10	0.11						0.09		
	(A) MU-MIMO w. corrdination 4tx	Cell avg	2.6											
		Cell-edge	0.075											
	(C or E) MU-MIMO w. corrdination 8tx	Cell avg	2.6		4.61		3.85							
		Cell-edge	0.075		0.12		0.12							
	(C) Joint processing CoMP 4tx	Cell avg	2.6	4.64										
		Cell-edge	0.075	0.10										
	(A) Joint processing CoMP 4tx	Cell avg	2.6											
		Cell-edge	0.075											
	(C or E) Joint processing CoMP 8tx	Cell avg	2.6											
		Cell-edge	0.075											
	(C or E) Rel-8 - single-layer BF 8tx	Cell avg	2.6											
		Cell-edge	0.075											
	(A) Rel-8 Uncorr + intercell interference canceller	Cell avg	2.6											
		Cell-edge	0.075											
	(C) Rel-8 Corrr + intercell interference canceller	Cell avg	2.6											
		Cell-edge	0.075											
	(A) SU-MIMO 8tx	Cell avg	2.6											
		Cell-edge	0.075											
	(C) SU-MIMO 8tx	Cell avg	2.6											
		Cell-edge	0.075											

Deployment scenario	Urban Micro-cell

Downlink L1/L2 control overhead	2 OFDM symbols per subframe

	FDD		Requirement	Company1	Company2	Company3	Company4	Company5	Company6	Company7	Company8	Company9	Company10	Company11	Company12	Company13	Company14	Company15	Company16	Company17
Downlink spectral efficiency	(A) Rel-8 Uncorr	Cell avg	2.6																	
		Cell-edge	0.075																	
	(B) Rel-8 Grouped	Cell avg	2.6																	
		Cell-edge	0.075																	
	(C) Rel-8 Corr	Cell avg	2.6																	
		Cell-edge	0.075																	
	(D) Rel-8 X-pol uncorr	Cell avg	2.6																	
		Cell-edge	0.075																	
	(E) Rel-8 X-pol corr	Cell avg	2.6																	
		Cell-edge	0.075																	
	(C) MU-MIMO w/o corrdination 4tx	Cell avg	2.6	2.96	3.09		3.77	3.35		3.09			3.29	3.29			3.02			
		Cell-edge	0.075	0.09	0.09		0.09	0.09		0.11			0.09	0.12			0.09			
	(A) MU-MIMO w/o corrdination 4tx	Cell avg	2.6					3.55		2.80				2.97						
		Cell-edge	0.075					0.12		0.11				0.10						
	(C) MU-MIMO w/o corrdination 8tx	Cell avg	2.6	4.19				4.20		3.25		3.63								
		Cell-edge	0.075	0.16				0.16		0.14		0.10								
	(C) MU-MIMO w. corrdination 4tx	Cell avg	2.6			3.13							3.23	3.34	3.55					3.12
		Cell-edge	0.075			0.10							0.09	0.13	0.09					0.08
	(A) MU-MIMO w. corrdination 4tx	Cell avg	2.6											3.03						
		Cell-edge	0.075											0.12						
	(C) MU-MIMO w. corrdination 8tx	Cell avg	2.6			4.40	3.66													
		Cell-edge	0.075			0.12	0.11													
	(C) Joint processing CoMP 4tx	Cell avg	2.6	4.07																
		Cell-edge	0.075	0.13																
	(A) Joint processing CoMP 4tx	Cell avg	2.6																	
		Cell-edge	0.075																	
	(C) Joint processing CoMP 8tx	Cell avg	2.6																	
		Cell-edge	0.075																	
	(C) Rel-8 - single-layer BF 8tx	Cell avg	2.6																	
		Cell-edge	0.075																	
	(A) Rel-8 Uncorr + intercell interference canceller	Cell avg	2.6													3.33				
		Cell-edge	0.075													0.09				
	(C) Rel-8 Corrr + intercell interference canceller	Cell avg	2.6													3.52				
		Cell-edge	0.075													0.09				
	(A) SU-MIMO 8tx	Cell avg	2.6																	
		Cell-edge	0.075																	
	(C) SU-MIMO 8tx	Cell avg	2.6																	
		Cell-edge	0.075																	

Deployment scenario	**Urban Micro-cell**

Downlink L1/L2 control overhead	**2 OFDM symbols per subframe**

	TDD		**Requirement**	Company1	Company2	Company3	Company4	Company6	Company7	Company8	Company9	Company12	Company16	Company11
Downlink spectral efficiency	(A) Rel-8 Uncorr	Cell avg	2.6											
		Cell-edge	0.075											
	(B) Rel-8 Grouped	Cell avg	2.6											
		Cell-edge	0.075											
	(C) Rel-8 Corr	Cell avg	2.6											
		Cell-edge	0.075											
	(D) Rel-8 X-pol uncorr	Cell avg	2.6											
		Cell-edge	0.075											
	(E) Rel-8 X-pol corr	Cell avg	2.6											
		Cell-edge	0.075											
	(C) MU-MIMO w/o corrdination 4tx	Cell avg	2.6	3.19	3.35		3.35	2.77	2.96	3.51	3.13			3.20
		Cell-edge	0.075	0.10	0.09		0.08	0.07	0.11	0.10	0.09			0.12
	(A) MU-MIMO w/o corrdination 4tx	Cell avg	2.6											2.92
		Cell-edge	0.075											0.10
	(C or E) MU-MIMO w/o corrdination 8tx	Cell avg	2.6	4.31	3.78					3.63	3.70			
		Cell-edge	0.075	0.12	0.10					0.11	0.10			
	(C) MU-MIMO w. corrdination 4tx	Cell avg	2.6		3.58	3.01						3.28		
		Cell-edge	0.075		0.10	0.10						0.09		
	(A) MU-MIMO w. corrdination 4tx	Cell avg	2.6											
		Cell-edge	0.075											
	(C or E) MU-MIMO w. corrdination 8tx	Cell avg	2.6		4.18		3.49							
		Cell-edge	0.075		0.10		0.10							
	(C) Joint processing CoMP 4tx	Cell avg	2.6	4.20										
		Cell-edge	0.075	0.09										
	(A) Joint processing CoMP 4tx	Cell avg	2.6											
		Cell-edge	0.075											
	(C or E) Joint processing CoMP 8tx	Cell avg	2.6											
		Cell-edge	0.075											
	(C or E) Rel-8 - single-layer BF 8tx	Cell avg	2.6											
		Cell-edge	0.075											
	(A) Rel-8 Uncorr + intercell interference canceller	Cell avg	2.6											
		Cell-edge	0.075											
	(C) Rel-8 Corrr + intercell interference canceller	Cell avg	2.6											
		Cell-edge	0.075											
	(A) SU-MIMO 8tx	Cell avg	2.6											
		Cell-edge	0.075											
	(C) SU-MIMO 8tx	Cell avg	2.6											
		Cell-edge	0.075											

Deployment scenario	Urban Micro-cell

Downlink L1/L2 control overhead	3 OFDM symbols per subframe

	FDD		Requirement	Company1	Company2	Company3	Company4	Company5	Company6	Company7	Company8	Company9	Company10	Company11	Company12	Company13	Company14	Company15	Company16	Company17
Downlink spectral efficiency	(A) Rel-8 Uncorr	Cell avg	2.6																	
		Cell-edge	0.075																	
	(B) Rel-8 Grouped	Cell avg	2.6																	
		Cell-edge	0.075																	
	(C) Rel-8 Corr	Cell avg	2.6																	
		Cell-edge	0.075																	
	(D) Rel-8 X-pol uncorr	Cell avg	2.6																	
		Cell-edge	0.075																	
	(E) Rel-8 X-pol corr	Cell avg	2.6																	
		Cell-edge	0.075																	
	(C) MU-MIMO w/o corrdination 4tx	Cell avg	2.6	2.68	2.81		3.42	3.03		2.80			2.98	2.99			2.74			
		Cell-edge	0.075	0.08	0.08		0.08	0.08		0.10			0.08	0.10			0.08			
	(A) MU-MIMO w/o corrdination 4tx	Cell avg	2.6					3.22		2.54				2.69						
		Cell-edge	0.075					0.11		0.10				0.09						
	(C) MU-MIMO w/o corrdination 8tx	Cell avg	2.6	3.78				3.80		2.95		3.29								
		Cell-edge	0.075	0.14				0.14		0.13		0.09								
	(C) MU-MIMO w. corrdination 4tx	Cell avg	2.6			2.84							2.93	3.03	3.22					2.83
		Cell-edge	0.075			0.09							0.08	0.12	0.08					0.07
	(A) MU-MIMO w. corrdination 4tx	Cell avg	2.6											2.74						
		Cell-edge	0.075											0.10						
	(C) MU-MIMO w. corrdination 8tx	Cell avg	2.6			3.99	3.32													
		Cell-edge	0.075			0.11	0.10													
	(C) Joint processing CoMP 4tx	Cell avg	2.6	3.68																
		Cell-edge	0.075	0.12																
	(A) Joint processing CoMP 4tx	Cell avg	2.6																	
		Cell-edge	0.075																	
	(C) Joint processing CoMP 8tx	Cell avg	2.6																	
		Cell-edge	0.075																	
	(C) Rel-8 - single-layer BF 8tx	Cell avg	2.6																	
		Cell-edge	0.075																	
	(A) Rel-8 Uncorr + intercell interference canceller	Cell avg	2.6													3.01				
		Cell-edge	0.075													0.08				
	(C) Rel-8 Corrr + intercell interference canceller	Cell avg	2.6													3.19				
		Cell-edge	0.075													0.09				
	(A) SU-MIMO 8tx	Cell avg	2.6																	
		Cell-edge	0.075																	
	(C) SU-MIMO 8tx	Cell avg	2.6																	
		Cell-edge	0.075																	

Deployment scenario	Urban Micro-cell

Downlink L1/L2 control overhead	3 OFDM symbols per subframe

	TDD		Requirement	Company1	Company2	Company3	Company4	Company6	Company7	Company8	Company9	Company12	Company16	Company11
Downlink spectral efficiency	(A) Rel-8 Uncorr	Cell avg	2.6											
		Cell-edge	0.075											
	(B) Rel-8 Grouped	Cell avg	2.6											
		Cell-edge	0.075											
	(C) Rel-8 Corr	Cell avg	2.6											
		Cell-edge	0.075											
	(D) Rel-8 X-pol uncorr	Cell avg	2.6											
		Cell-edge	0.075											
	(E) Rel-8 X-pol corr	Cell avg	2.6											
		Cell-edge	0.075											
	(C) MU-MIMO w/o corrdination 4tx	Cell avg	2.6	2.97	3.12		3.12	2.58	2.75	3.27	2.92			2.98
		Cell-edge	0.075	0.09	0.09		0.08	0.07	0.10	0.10	0.08			0.11
	(A) MU-MIMO w/o corrdination 4tx	Cell avg	2.6											2.72
		Cell-edge	0.075											0.09
	(C or E) MU-MIMO w/o corrdination 8tx	Cell avg	2.6	4.01	3.52					3.38	3.45			
		Cell-edge	0.075	0.11	0.09					0.10	0.10			
	(C) MU-MIMO w. corrdination 4tx	Cell avg	2.6		3.33	2.80						3.05		
		Cell-edge	0.075		0.09	0.09						0.08		
	(A) MU-MIMO w. corrdination 4tx	Cell avg	2.6											
		Cell-edge	0.075											
	(C or E) MU-MIMO w. corrdination 8tx	Cell avg	2.6		3.89		3.25							
		Cell-edge	0.075		0.10		0.10							
	(C) Joint processing CoMP 4tx	Cell avg	2.6	3.92										
		Cell-edge	0.075	0.09										
	(A) Joint processing CoMP 4tx	Cell avg	2.6											
		Cell-edge	0.075											
	(C or E) Joint processing CoMP 8tx	Cell avg	2.6											
		Cell-edge	0.075											
	(C or E) Rel-8 - single-layer BF 8tx	Cell avg	2.6											
		Cell-edge	0.075											
	(A) Rel-8 Uncorr + intercell interference canceller	Cell avg	2.6											
		Cell-edge	0.075											
	(C) Rel-8 Corrr + intercell interference canceller	Cell avg	2.6											
		Cell-edge	0.075											
	(A) SU-MIMO 8tx	Cell avg	2.6											
		Cell-edge	0.075											
	(C) SU-MIMO 8tx	Cell avg	2.6											
		Cell-edge	0.075											

Deployment scenario	**Urban Macro-cell**

Downlink L1/L2 control overhead	**1 OFDM symbols per subframe**

	FDD		**Requirement**	Company1	Company2	Company3	Company4	Company5	Company6	Company7	Company8	Company9	Company10	Company11	Company12	Company13	Company14	Company15	Company16	Company17
Downlink spectral efficiency	(A) Rel-8 Uncorr	Cell avg	2.2																	
		Cell-edge	0.06																	
	(B) Rel-8 Grouped	Cell avg	2.2																	
		Cell-edge	0.06																	
	(C) Rel-8 Corr	Cell avg	2.2																	
		Cell-edge	0.06																	
	(D) Rel-8 X-pol uncorr	Cell avg	2.2																	
		Cell-edge	0.06																	
	(E) Rel-8 X-pol corr	Cell avg	2.2																	
		Cell-edge	0.06																	
	(C) MU-MIMO w/o corrdination 4tx	Cell avg	2.2	2.76		2.87		2.74		2.91			3.02	2.88			2.68			
		Cell-edge	0.06	0.07		0.09		0.07		0.07			0.08	0.09			0.07			
	(A) MU-MIMO w/o corrdination 4tx	Cell avg	2.2	2.26				2.88												
		Cell-edge	0.06	0.06				0.08												
	(C) MU-MIMO w/o corrdination 8tx	Cell avg	2.2	3.52				3.47				3.02								
		Cell-edge	0.06	0.12				0.13				0.08								
	(C) MU-MIMO w. corrdination 4tx	Cell avg	2.2		3.16	2.87							2.77	2.85	2.79					2.66
		Cell-edge	0.06		0.08	0.09							0.08	0.10	0.08					0.07
	(A) MU-MIMO w. corrdination 4tx	Cell avg	2.2																	
		Cell-edge	0.06																	
	(C) MU-MIMO w. corrdination 8tx	Cell avg	2.2			4.03	3.55								3.90					
		Cell-edge	0.06			0.11	0.11								0.09					
	(C) Joint processing CoMP 4tx	Cell avg	2.2	3.11																
		Cell-edge	0.06	0.08																
	(A) Joint processing CoMP 4tx	Cell avg	2.2					2.98												
		Cell-edge	0.06					0.08												
	(C) Joint processing CoMP 8tx	Cell avg	2.2																	
		Cell-edge	0.06																	
	(C) Rel-8 - single-layer BF 8tx	Cell avg	2.2																	
		Cell-edge	0.06																	
	(A) Rel-8 Uncorr + intercell interference canceller	Cell avg	2.2													2.55				
		Cell-edge	0.06													0.06				
	(C) Rel-8 Corrr + intercell interference canceller	Cell avg	2.2													2.62				
		Cell-edge	0.06													0.07				
	(A) SU-MIMO 8tx	Cell avg	2.2																	
		Cell-edge	0.06																	
	(C) SU-MIMO 8tx	Cell avg	2.2																	
		Cell-edge	0.06																	

Deployment scenario	**Urban Macro-cell**

Downlink L1/L2 control overhead	**1 OFDM symbols per subframe**

	TDD		**Requirement**	Company1	Company2	Company3	Company4	Company6	Company7	Company8	Company9	Company12	Company16	Company11
Downlink spectral efficiency	(A) Rel-8 Uncorr	Cell avg	2.2											
		Cell-edge	0.06											
	(B) Rel-8 Grouped	Cell avg	2.2											
		Cell-edge	0.06											
	(C) Rel-8 Corr	Cell avg	2.2											
		Cell-edge	0.06											
	(D) Rel-8 X-pol uncorr	Cell avg	2.2											
		Cell-edge	0.06											
	(E) Rel-8 X-pol corr	Cell avg	2.2											
		Cell-edge	0.06											
	(C) MU-MIMO w/o corrdination 4tx	Cell avg	2.2	2.89	3.16			2.14	2.92	3.15	2.93			2.82
		Cell-edge	0.06	0.08	0.08			0.05	0.07	0.10	0.08			0.09
	(A) MU-MIMO w/o corrdination 4tx	Cell avg	2.2	2.28										
		Cell-edge	0.06	0.07										
	(C or E) MU-MIMO w/o corrdination 8tx	Cell avg	2.2	4.22	3.78					3.51	3.41			
		Cell-edge	0.06	0.13	0.09					0.09	0.09			
	(C) MU-MIMO w. corrdination 4tx	Cell avg	2.2		3.29	2.79						2.64		2.69
		Cell-edge	0.06		0.09	0.09						0.07		0.08
	(A) MU-MIMO w. corrdination 4tx	Cell avg	2.2											
		Cell-edge	0.06											
	(C or E) MU-MIMO w. corrdination 8tx	Cell avg	2.2		3.97		3.34					3.65		
		Cell-edge	0.06		0.11		0.11					0.09		
	(C) Joint processing CoMP 4tx	Cell avg	2.2	3.64										
		Cell-edge	0.06	0.09										
	(A) Joint processing CoMP 4tx	Cell avg	2.2											
		Cell-edge	0.06											
	(C or E) Joint processing CoMP 8tx	Cell avg	2.2											
		Cell-edge	0.06											
	(C or E) Rel-8 - single-layer BF 8tx	Cell avg	2.2											
		Cell-edge	0.06											
	(A) Rel-8 Uncorr + intercell interference canceller	Cell avg	2.2											
		Cell-edge	0.06											
	(C) Rel-8 Corrr + intercell interference canceller	Cell avg	2.2											
		Cell-edge	0.06											
	(A) SU-MIMO 8tx	Cell avg	2.2											
		Cell-edge	0.06											
	(C) SU-MIMO 8tx	Cell avg	2.2											
		Cell-edge	0.06											

Deployment scenario	Urban Macro-cell

Downlink L1/L2 control overhead	2 OFDM symbols per subframe

	FDD		Requirement	Company1	Company2	Company3	Company4	Company5	Company6	Company7	Company8	Company9	Company10	Company11	Company12	Company13	Company14	Company15	Company16	Company17
Downlink spectral efficiency	(A) Rel-8 Uncorr	Cell avg	2.2																	
		Cell-edge	0.06																	
	(B) Rel-8 Grouped	Cell avg	2.2																	
		Cell-edge	0.06																	
	(C) Rel-8 Corr	Cell avg	2.2																	
		Cell-edge	0.06																	
	(D) Rel-8 X-pol uncorr	Cell avg	2.2																	
		Cell-edge	0.06																	
	(E) Rel-8 X-pol corr	Cell avg	2.2																	
		Cell-edge	0.06																	
	(C) MU-MIMO w/o corrdination 4tx	Cell avg	2.2	2.52		2.63		2.51		2.66			2.76	2.63			2.45			
		Cell-edge	0.06	0.07		0.08		0.07		0.07			0.07	0.08			0.07			
	(A) MU-MIMO w/o corrdination 4tx	Cell avg	2.2	2.06				2.63												
		Cell-edge	0.06	0.06				0.07												
	(C) MU-MIMO w/o corrdination 8tx	Cell avg	2.2	3.21				3.17				2.76								
		Cell-edge	0.06	0.11				0.12				0.08								
	(C) MU-MIMO w. corrdination 4tx	Cell avg	2.2		2.89	2.63							2.54	2.61	2.55					2.43
		Cell-edge	0.06		0.07	0.08							0.07	0.09	0.07					0.06
	(A) MU-MIMO w. corrdination 4tx	Cell avg	2.2																	
		Cell-edge	0.06																	
	(C) MU-MIMO w. corrdination 8tx	Cell avg	2.2			3.68	3.25								3.57					
		Cell-edge	0.06			0.10	0.10								0.08					
	(C) Joint processing CoMP 4tx	Cell avg	2.2	2.84																
		Cell-edge	0.06	0.08																
	(A) Joint processing CoMP 4tx	Cell avg	2.2					2.72												
		Cell-edge	0.06					0.07												
	(C) Joint processing CoMP 8tx	Cell avg	2.2																	
		Cell-edge	0.06																	
	(C) Rel-8 - single-layer BF 8tx	Cell avg	2.2																	
		Cell-edge	0.06																	
	(A) Rel-8 Uncorr + intercell interference canceller	Cell avg	2.2													2.40				
		Cell-edge	0.06													0.06				
	(C) Rel-8 Corrr + intercell interference canceller	Cell avg	2.2													2.46				
		Cell-edge	0.06													0.07				
	(A) SU-MIMO 8tx	Cell avg	2.2																	
		Cell-edge	0.06																	
	(C) SU-MIMO 8tx	Cell avg	2.2																	
		Cell-edge	0.06																	

Deployment scenario	Urban Macro-cell

Downlink L1/L2 control overhead	2 OFDM symbols per subframe

	TDD		Requirement	Company1	Company2	Company3	Company4	Company6	Company7	Company8	Company9	Company12	Company16	Company11
Downlink spectral efficiency	(A) Rel-8 Uncorr	Cell avg	2.2											
		Cell-edge	0.06											
	(B) Rel-8 Grouped	Cell avg	2.2											
		Cell-edge	0.06											
	(C) Rel-8 Corr	Cell avg	2.2											
		Cell-edge	0.06											
	(D) Rel-8 X-pol uncorr	Cell avg	2.2											
		Cell-edge	0.06											
	(E) Rel-8 X-pol corr	Cell avg	2.2											
		Cell-edge	0.06											
	(C) MU-MIMO w/o corrdination 4tx	Cell avg	2.2	2.62	2.87			1.94	2.65	2.86	2.65			2.56
		Cell-edge	0.06	0.07	0.08			0.05	0.07	0.09	0.07			0.08
	(A) MU-MIMO w/o corrdination 4tx	Cell avg	2.2	2.07										
		Cell-edge	0.06	0.06										
	(C or E) MU-MIMO w/o corrdination 8tx	Cell avg	2.2	3.82	3.43					3.18	3.09			
		Cell-edge	0.06	0.11	0.08					0.08	0.08			
	(C) MU-MIMO w. corrdination 4tx	Cell avg	2.2		2.99	2.53						2.40		2.44
		Cell-edge	0.06		0.08	0.08						0.07		0.08
	(A) MU-MIMO w. corrdination 4tx	Cell avg	2.2											
		Cell-edge	0.06											
	(C or E) MU-MIMO w. corrdination 8tx	Cell avg	2.2		3.60		3.03					3.31		
		Cell-edge	0.06		0.10		0.10					0.08		
	(C) Joint processing CoMP 4tx	Cell avg	2.2	3.30										
		Cell-edge	0.06	0.08										
	(A) Joint processing CoMP 4tx	Cell avg	2.2											
		Cell-edge	0.06											
	(C or E) Joint processing CoMP 8tx	Cell avg	2.2											
		Cell-edge	0.06											
	(C or E) Rel-8 - single-layer BF 8tx	Cell avg	2.2											
		Cell-edge	0.06											
	(A) Rel-8 Uncorr + intercell interference canceller	Cell avg	2.2											
		Cell-edge	0.06											
	(C) Rel-8 Corrr + intercell interference canceller	Cell avg	2.2											
		Cell-edge	0.06											
	(A) SU-MIMO 8tx	Cell avg	2.2											
		Cell-edge	0.06											
	(C) SU-MIMO 8tx	Cell avg	2.2											
		Cell-edge	0.06											

Deployment scenario	Urban Macro-cell

Downlink L1/L2 control overhead	3 OFDM symbols per subframe

	FDD		Requirement	Company1	Company2	Company3	Company4	Company5	Company6	Company7	Company8	Company9	Company10	Company11	Company12	Company13	Company14	Company15	Company16	Company17
Downlink spectral efficiency	(A) Rel-8 Uncorr	Cell avg	2.2																	
		Cell-edge	0.06																	
	(B) Rel-8 Grouped	Cell avg	2.2																	
		Cell-edge	0.06																	
	(C) Rel-8 Corr	Cell avg	2.2																	
		Cell-edge	0.06																	
	(D) Rel-8 X-pol uncorr	Cell avg	2.2																	
		Cell-edge	0.06																	
	(E) Rel-8 X-pol corr	Cell avg	2.2																	
		Cell-edge	0.06																	
	(C) MU-MIMO w/o corrdination 4tx	Cell avg	2.2	2.28		2.38		2.27		2.41			2.50	2.39			2.22			
		Cell-edge	0.06	0.06		0.07		0.06		0.06			0.07	0.08			0.06			
	(A) MU-MIMO w/o corrdination 4tx	Cell avg	2.2	1.87				2.38												
		Cell-edge	0.06	0.05				0.07												
	(C) MU-MIMO w/o corrdination 8tx	Cell avg	2.2	2.89				2.86				2.50								
		Cell-edge	0.06	0.10				0.11				0.07								
	(C) MU-MIMO w. corrdination 4tx	Cell avg	2.2		2.62	2.38							2.30	2.36	2.31					2.20
		Cell-edge	0.06		0.07	0.07							0.06	0.08	0.06					0.05
	(A) MU-MIMO w. corrdination 4tx	Cell avg	2.2																	
		Cell-edge	0.06																	
	(C) MU-MIMO w. corrdination 8tx	Cell avg	2.2			3.34	2.95								3.23					
		Cell-edge	0.06			0.09	0.09								0.07					
	(C) Joint processing CoMP 4tx	Cell avg	2.2	2.57																
		Cell-edge	0.06	0.07																
	(A) Joint processing CoMP 4tx	Cell avg	2.2					2.46												
		Cell-edge	0.06					0.07												
	(C) Joint processing CoMP 8tx	Cell avg	2.2																	
		Cell-edge	0.06																	
	(C) Rel-8 - single-layer BF 8tx	Cell avg	2.2																	
		Cell-edge	0.06																	
	(A) Rel-8 Uncorr + intercell interference canceller	Cell avg	2.2													2.17				
		Cell-edge	0.06													0.05				
	(C) Rel-8 Corrr + intercell interference canceller	Cell avg	2.2													2.23				
		Cell-edge	0.06													0.06				
	(A) SU-MIMO 8tx	Cell avg	2.2																	
		Cell-edge	0.06																	
	(C) SU-MIMO 8tx	Cell avg	2.2																	
		Cell-edge	0.06																	

Deployment scenario	Urban Macro-cell

Downlink L1/L2 control overhead	3 OFDM symbols per subframe

	TDD		Requirement	Company1	Company2	Company3	Company4	Company6	Company7	Company8	Company9	Company12	Company16	Company11
Downlink spectral efficiency	(A) Rel-8 Uncorr	Cell avg	2.2											
		Cell-edge	0.06											
	(B) Rel-8 Grouped	Cell avg	2.2											
		Cell-edge	0.06											
	(C) Rel-8 Corr	Cell avg	2.2											
		Cell-edge	0.06											
	(D) Rel-8 X-pol uncorr	Cell avg	2.2											
		Cell-edge	0.06											
	(E) Rel-8 X-pol corr	Cell avg	2.2											
		Cell-edge	0.06											
	(C) MU-MIMO w/o corrdination 4tx	Cell avg	2.2	2.44	2.67			1.81	2.47	2.66	2.47			2.39
		Cell-edge	0.06	0.06	0.07			0.04	0.06	0.08	0.07			0.07
	(A) MU-MIMO w/o corrdination 4tx	Cell avg	2.2	1.93										
		Cell-edge	0.06	0.06										
	(C or E) MU-MIMO w/o corrdination 8tx	Cell avg	2.2	3.56	3.19					2.97	2.88			
		Cell-edge	0.06	0.11	0.08					0.08	0.08			
	(C) MU-MIMO w. corrdination 4tx	Cell avg	2.2		2.78	2.36						2.23		2.28
		Cell-edge	0.06		0.08	0.07						0.06		0.07
	(A) MU-MIMO w. corrdination 4tx	Cell avg	2.2											
		Cell-edge	0.06											
	(C or E) MU-MIMO w. corrdination 8tx	Cell avg	2.2		3.35		2.82					3.08		
		Cell-edge	0.06		0.09		0.09					0.07		
	(C) Joint processing CoMP 4tx	Cell avg	2.2	3.07										
		Cell-edge	0.06	0.08										
	(A) Joint processing CoMP 4tx	Cell avg	2.2											
		Cell-edge	0.06											
	(C or E) Joint processing CoMP 8tx	Cell avg	2.2											
		Cell-edge	0.06											
	(C or E) Rel-8 - single-layer BF 8tx	Cell avg	2.2											
		Cell-edge	0.06											
	(A) Rel-8 Uncorr + intercell interference canceller	Cell avg	2.2											
		Cell-edge	0.06											
	(C) Rel-8 Corrr + intercell interference canceller	Cell avg	2.2											
		Cell-edge	0.06											
	(A) SU-MIMO 8tx	Cell avg	2.2											
		Cell-edge	0.06											
	(C) SU-MIMO 8tx	Cell avg	2.2											
		Cell-edge	0.06											

Deployment scenario	Rural Macro-cell

Downlink L1/L2 control overhead	1 OFDM symbols per subframe

	FDD		Requirement	Company1	Company2	Company3	Company4	Company5	Company6	Company7	Company8	Company9	Company10	Company11	Company12	Company13	Company14	Company15	Company16	Company17
Downlink spectral efficiency	(A) Rel-8 Uncorr	Cell avg	1.1	2.21	1.98		1.88	2.29	1.87		2.29	1.74	2.26		2.11	2.19	2.29		1.44	2.14
		Cell-edge	0.04	0.08	0.06		0.06	0.08	0.06		0.07	0.05	0.08		0.05	0.07	0.07		0.05	0.07
	(B) Rel-8 Grouped	Cell avg	1.1																1.49	
		Cell-edge	0.04																0.05	
	(C) Rel-8 Corr	Cell avg	1.1	2.44	2.17	2.28	2.07	2.47		2.24	2.47	1.92	2.42	1.96		2.30	2.54		1.48	2.17
		Cell-edge	0.04	0.10	0.08	0.09	0.08	0.10		0.06	0.08	0.06	0.09	0.08		0.08	0.08		0.05	0.07
	(D) Rel-8 X-pol uncorr	Cell avg	1.1																	
		Cell-edge	0.04																	
	(E) Rel-8 X-pol corr	Cell avg	1.1	2.15		2.19				2.13										
		Cell-edge	0.04	0.09		0.06				0.05										
	(C) MU-MIMO w/o corrdination 4tx	Cell avg	1.1			4.19				3.45							3.93			
		Cell-edge	0.04			0.14				0.09							0.10			
	(A) MU-MIMO w/o corrdination 4tx	Cell avg	1.1																	
		Cell-edge	0.04																	
	(C) MU-MIMO w/o corrdination 8tx	Cell avg	1.1									4.08								
		Cell-edge	0.04									0.13								
	(C) MU-MIMO w. corrdination 4tx	Cell avg	1.1																	
		Cell-edge	0.04																	
	(A) MU-MIMO w. corrdination 4tx	Cell avg	1.1																	
		Cell-edge	0.04																	
	(C) MU-MIMO w. corrdination 8tx	Cell avg	1.1																	
		Cell-edge	0.04																	
	(C) Joint processing CoMP 4tx	Cell avg	1.1																	
		Cell-edge	0.04																	
	(A) Joint processing CoMP 4tx	Cell avg	1.1																	
		Cell-edge	0.04																	
	(C) Joint processing CoMP 8tx	Cell avg	1.1																	
		Cell-edge	0.04																	
	(C) Rel-8 - single-layer BF 8tx	Cell avg	1.1																	
		Cell-edge	0.04																	
	(A) Rel-8 Uncorr + intercell interference canceller	Cell avg	1.1													3.12				
		Cell-edge	0.04													0.11				
	(C) Rel-8 Corrr + intercell interference canceller	Cell avg	1.1													3.18				
		Cell-edge	0.04													0.12				
	(A) SU-MIMO 8tx	Cell avg	1.1																	
		Cell-edge	0.04																	
	(C) SU-MIMO 8tx	Cell avg	1.1																	
		Cell-edge	0.04																	

Deployment scenario	Rural Macro-cell

Downlink L1/L2 control overhead	1 OFDM symbols per subframe

	TDD		Requirement	Company1	Company2	Company3	Company4	Company6	Company7	Company8	Company9	Company12	Company16	Company11
Downlink spectral efficiency	(A) Rel-8 Uncorr	Cell avg	1.1	2.12	1.98		1.68			2.16	1.70	1.99	1.44	
		Cell-edge	0.04	0.08	0.06		0.05			0.06	0.05	0.05	0.05	
	(B) Rel-8 Grouped	Cell avg	1.1										1.52	
		Cell-edge	0.04										0.05	
	(C) Rel-8 Corr	Cell avg	1.1	2.32	2.18		1.85		2.04	2.37	1.87		1.50	2.08
		Cell-edge	0.04	0.10	0.08		0.07		0.05	0.08	0.06		0.05	0.09
	(D) Rel-8 X-pol uncorr	Cell avg	1.1											
		Cell-edge	0.04											
	(E) Rel-8 X-pol corr	Cell avg	1.1	2.04										
		Cell-edge	0.04	0.08										
	(C) MU-MIMO w/o corrdination 4tx	Cell avg	1.1		3.36				3.45	4.02	3.37			
		Cell-edge	0.04		0.10				0.09	0.10	0.10			
	(A) MU-MIMO w/o corrdination 4tx	Cell avg	1.1											
		Cell-edge	0.04											
	(C or E) MU-MIMO w/o corrdination 8tx	Cell avg	1.1		4.04						3.92			
		Cell-edge	0.04		0.11						0.13			
	(C) MU-MIMO w. corrdination 4tx	Cell avg	1.1			4.08								
		Cell-edge	0.04			0.13								
	(A) MU-MIMO w. corrdination 4tx	Cell avg	1.1											
		Cell-edge	0.04											
	(C or E) MU-MIMO w. corrdination 8tx	Cell avg	1.1											
		Cell-edge	0.04											
	(C) Joint processing CoMP 4tx	Cell avg	1.1											
		Cell-edge	0.04											
	(A) Joint processing CoMP 4tx	Cell avg	1.1											
		Cell-edge	0.04											
	(C or E) Joint processing CoMP 8tx	Cell avg	1.1											
		Cell-edge	0.04											
	(C or E) Rel-8 - single-layer BF 8tx	Cell avg	1.1	2.61	2.38		2.34				2.60			
		Cell-edge	0.04	0.13	0.09		0.13				0.10			
	(A) Rel-8 Uncorr + intercell interference canceller	Cell avg	1.1											
		Cell-edge	0.04											
	(C) Rel-8 Corrr + intercell interference canceller	Cell avg	1.1											
		Cell-edge	0.04											
	(A) SU-MIMO 8tx	Cell avg	1.1											
		Cell-edge	0.04											
	(C) SU-MIMO 8tx	Cell avg	1.1											
		Cell-edge	0.04											

Deployment scenario	Rural Macro-cell

Downlink L1/L2 control overhead	2 OFDM symbols per subframe

	FDD		Requirement	Company1	Company2	Company3	Company4	Company5	Company6	Company7	Company8	Company9	Company10	Company11	Company12	Company13	Company14	Company15	Company16	Company17
Downlink spectral efficiency	(A) Rel-8 Uncorr	Cell avg	1.1	2.08	1.86		1.77	2.16	1.76		2.15	1.64	2.12		1.99	2.06	2.15		1.35	2.01
		Cell-edge	0.04	0.08	0.06		0.06	0.07	0.05		0.06	0.05	0.07		0.04	0.07	0.06		0.04	0.06
	(B) Rel-8 Grouped	Cell avg	1.1																1.40	
		Cell-edge	0.04																0.04	
	(C) Rel-8 Corr	Cell avg	1.1	2.29	2.04	2.14	1.94	2.32		2.11	2.32	1.80	2.28	1.85		2.17	2.39		1.39	2.04
		Cell-edge	0.04	0.10	0.07	0.08	0.08	0.09		0.05	0.08	0.06	0.09	0.08		0.07	0.08		0.05	0.06
	(D) Rel-8 X-pol uncorr	Cell avg	1.1																	
		Cell-edge	0.04																	
	(E) Rel-8 X-pol corr	Cell avg	1.1	2.02		2.06				2.00										
		Cell-edge	0.04	0.08		0.06				0.05										
	(C) MU-MIMO w/o corrdination 4tx	Cell avg	1.1			3.83				3.16							3.59			
		Cell-edge	0.04			0.12				0.08							0.09			
	(A) MU-MIMO w/o corrdination 4tx	Cell avg	1.1																	
		Cell-edge	0.04																	
	(C) MU-MIMO w/o corrdination 8tx	Cell avg	1.1									3.73								
		Cell-edge	0.04									0.12								
	(C) MU-MIMO w. corrdination 4tx	Cell avg	1.1																	
		Cell-edge	0.04																	
	(A) MU-MIMO w. corrdination 4tx	Cell avg	1.1																	
		Cell-edge	0.04																	
	(C) MU-MIMO w. corrdination 8tx	Cell avg	1.1																	
		Cell-edge	0.04																	
	(C) Joint processing CoMP 4tx	Cell avg	1.1																	
		Cell-edge	0.04																	
	(A) Joint processing CoMP 4tx	Cell avg	1.1																	
		Cell-edge	0.04																	
	(C) Joint processing CoMP 8tx	Cell avg	1.1																	
		Cell-edge	0.04																	
	(C) Rel-8 - single-layer BF 8tx	Cell avg	1.1																	
		Cell-edge	0.04																	
	(A) Rel-8 Uncorr + intercell interference canceller	Cell avg	1.1													2.93				
		Cell-edge	0.04													0.10				
	(C) Rel-8 Corrr + intercell interference canceller	Cell avg	1.1													2.99				
		Cell-edge	0.04													0.11				
	(A) SU-MIMO 8tx	Cell avg	1.1																	
		Cell-edge	0.04																	
	(C) SU-MIMO 8tx	Cell avg	1.1																	
		Cell-edge	0.04																	

Deployment scenario	Rural Macro-cell

Downlink L1/L2 control overhead	2 OFDM symbols per subframe

	TDD		Requirement	Company1	Company2	Company3	Company4	Company6	Company7	Company8	Company9	Company12	Company16	Company11
Downlink spectral efficiency	(A) Rel-8 Uncorr	Cell avg	1.1	1.98	1.85		1.57			2.02	1.59	1.86	1.35	
		Cell-edge	0.04	0.07	0.06		0.05			0.06	0.05	0.04	0.04	
	(B) Rel-8 Grouped	Cell avg	1.1										1.42	
		Cell-edge	0.04										0.04	
	(C) Rel-8 Corr	Cell avg	1.1	2.17	2.04		1.73		1.91	2.22	1.75		1.41	1.94
		Cell-edge	0.04	0.09	0.07		0.07		0.05	0.08	0.05		0.05	0.08
	(D) Rel-8 X-pol uncorr	Cell avg	1.1											
		Cell-edge	0.04											
	(E) Rel-8 X-pol corr	Cell avg	1.1	1.91										
		Cell-edge	0.04	0.08										
	(C) MU-MIMO w/o corrdination 4tx	Cell avg	1.1		3.04				3.13	3.64	3.05			
		Cell-edge	0.04		0.09				0.08	0.09	0.09			
	(A) MU-MIMO w/o corrdination 4tx	Cell avg	1.1											
		Cell-edge	0.04											
	(C or E) MU-MIMO w/o corrdination 8tx	Cell avg	1.1		3.67						3.55			
		Cell-edge	0.04		0.10						0.11			
	(C) MU-MIMO w. corrdination 4tx	Cell avg	1.1			3.70								
		Cell-edge	0.04			0.12								
	(A) MU-MIMO w. corrdination 4tx	Cell avg	1.1											
		Cell-edge	0.04											
	(C or E) MU-MIMO w. corrdination 8tx	Cell avg	1.1											
		Cell-edge	0.04											
	(C) Joint processing CoMP 4tx	Cell avg	1.1											
		Cell-edge	0.04											
	(A) Joint processing CoMP 4tx	Cell avg	1.1											
		Cell-edge	0.04											
	(C or E) Joint processing CoMP 8tx	Cell avg	1.1											
		Cell-edge	0.04											
	(C or E) Rel-8 - single-layer BF 8tx	Cell avg	1.1	2.37	2.16		2.12				2.36			
		Cell-edge	0.04	0.12	0.08		0.11				0.09			
	(A) Rel-8 Uncorr + intercell interference canceller	Cell avg	1.1											
		Cell-edge	0.04											
	(C) Rel-8 Corrr + intercell interference canceller	Cell avg	1.1											
		Cell-edge	0.04											
	(A) SU-MIMO 8tx	Cell avg	1.1											
		Cell-edge	0.04											
	(C) SU-MIMO 8tx	Cell avg	1.1											
		Cell-edge	0.04											

Deployment scenario	Rural Macro-cell

Downlink L1/L2 control overhead	3 OFDM symbols per subframe

	FDD		Requirement	Company1	Company2	Company3	Company4	Company5	Company6	Company7	Company8	Company9	Company10	Company11	Company12	Company13	Company14	Company15	Company16	Company17
Downlink spectral efficiency	(A) Rel-8 Uncorr	Cell avg	1.1	1.88	1.69		1.60	1.95	1.60		1.95	1.48	1.92		1.80	1.86	1.95		1.22	1.82
		Cell-edge	0.04	0.07	0.05		0.05	0.07	0.05		0.06	0.05	0.07		0.04	0.06	0.06		0.04	0.06
	(B) Rel-8 Grouped	Cell avg	1.1																1.27	
		Cell-edge	0.04																0.04	
	(C) Rel-8 Corr	Cell avg	1.1	2.08	1.85	1.94	1.76	2.10		1.91	2.10	1.63	2.06	1.67		1.96	2.16		1.26	1.85
		Cell-edge	0.04	0.09	0.07	0.07	0.07	0.08		0.05	0.07	0.05	0.08	0.07		0.07	0.07		0.04	0.06
	(D) Rel-8 X-pol uncorr	Cell avg	1.1																	
		Cell-edge	0.04																	
	(E) Rel-8 X-pol corr	Cell avg	1.1	1.83		1.86				1.81										
		Cell-edge	0.04	0.07		0.05				0.04										
	(C) MU-MIMO w/o corrdination 4tx	Cell avg	1.1			3.47				2.86							3.26			
		Cell-edge	0.04			0.11				0.07							0.08			
	(A) MU-MIMO w/o corrdination 4tx	Cell avg	1.1																	
		Cell-edge	0.04																	
	(C) MU-MIMO w/o corrdination 8tx	Cell avg	1.1									3.38								
		Cell-edge	0.04									0.11								
	(C) MU-MIMO w. corrdination 4tx	Cell avg	1.1																	
		Cell-edge	0.04																	
	(A) MU-MIMO w. corrdination 4tx	Cell avg	1.1																	
		Cell-edge	0.04																	
	(C) MU-MIMO w. corrdination 8tx	Cell avg	1.1																	
		Cell-edge	0.04																	
	(C) Joint processing CoMP 4tx	Cell avg	1.1																	
		Cell-edge	0.04																	
	(A) Joint processing CoMP 4tx	Cell avg	1.1																	
		Cell-edge	0.04																	
	(C) Joint processing CoMP 8tx	Cell avg	1.1																	
		Cell-edge	0.04																	
	(C) Rel-8 - single-layer BF 8tx	Cell avg	1.1																	
		Cell-edge	0.04																	
	(A) Rel-8 Uncorr + intercell interference canceller	Cell avg	1.1													2.66				
		Cell-edge	0.04													0.09				
	(C) Rel-8 Corrr + intercell interference canceller	Cell avg	1.1													2.71				
		Cell-edge	0.04													0.10				
	(A) SU-MIMO 8tx	Cell avg	1.1																	
		Cell-edge	0.04																	
	(C) SU-MIMO 8tx	Cell avg	1.1																	
		Cell-edge	0.04																	

Deployment scenario	Rural Macro-cell

Downlink L1/L2 control overhead	3 OFDM symbols per subframe

	TDD		Requirement	Company1	Company2	Company3	Company4	Company6	Company7	Company8	Company9	Company12	Company16	Company11
Downlink spectral efficiency	(A) Rel-8 Uncorr	Cell avg	1.1	1.84	1.73		1.46			1.89	1.48	1.73	1.26	
		Cell-edge	0.04	0.07	0.05		0.05			0.05	0.04	0.04	0.04	
	(B) Rel-8 Grouped	Cell avg	1.1										1.32	
		Cell-edge	0.04										0.04	
	(C) Rel-8 Corr	Cell avg	1.1	2.02	1.90		1.61		1.78	2.06	1.63		1.31	1.81
		Cell-edge	0.04	0.08	0.07		0.06		0.04	0.07	0.05		0.04	0.08
	(D) Rel-8 X-pol uncorr	Cell avg	1.1											
		Cell-edge	0.04											
	(E) Rel-8 X-pol corr	Cell avg	1.1	1.78										
		Cell-edge	0.04	0.07										
	(C) MU-MIMO w/o corrdination 4tx	Cell avg	1.1		2.83				2.92	3.39	2.85			
		Cell-edge	0.04		0.08				0.08	0.09	0.09			
	(A) MU-MIMO w/o corrdination 4tx	Cell avg	1.1											
		Cell-edge	0.04											
	(C or E) MU-MIMO w/o corrdination 8tx	Cell avg	1.1		3.42						3.31			
		Cell-edge	0.04		0.09						0.11			
	(C) MU-MIMO w. corrdination 4tx	Cell avg	1.1			3.45								
		Cell-edge	0.04			0.11								
	(A) MU-MIMO w. corrdination 4tx	Cell avg	1.1											
		Cell-edge	0.04											
	(C or E) MU-MIMO w. corrdination 8tx	Cell avg	1.1											
		Cell-edge	0.04											
	(C) Joint processing CoMP 4tx	Cell avg	1.1											
		Cell-edge	0.04											
	(A) Joint processing CoMP 4tx	Cell avg	1.1											
		Cell-edge	0.04											
	(C or E) Joint processing CoMP 8tx	Cell avg	1.1											
		Cell-edge	0.04											
	(C or E) Rel-8 - single-layer BF 8tx	Cell avg	1.1	2.20	2.00		1.97				2.19			
		Cell-edge	0.04	0.11	0.07		0.11				0.09			
	(A) Rel-8 Uncorr + intercell interference canceller	Cell avg	1.1											
		Cell-edge	0.04											
	(C) Rel-8 Corrr + intercell interference canceller	Cell avg	1.1											
		Cell-edge	0.04											
	(A) SU-MIMO 8tx	Cell avg	1.1											
		Cell-edge	0.04											
	(C) SU-MIMO 8tx	Cell avg	1.1											
		Cell-edge	0.04											

Deployment scenario	Indoor Hotspot

	FDD		Requirement	Company1	Company2	Company3	Company4	Company5	Company6	Company7	Company8	Company9	Company10	Company11	Company12	Company13	Company14	Company15	Company16	Company17
Uplink spectral efficiency / IoT	(A) Rel-8 Uncorr	Cell avg	2.25	3.40	3.34	3.47	3.36	3.39		2.98	3.18	3.37	3.48	3.09	2.86	3.35				3.32
		Cell-edge	0.07	0.244	0.22	0.26	0.24	0.245		0.212	0.230	0.280	0.240	0.200	0.17	0.232				0.239
		IoT		0.139	0.48	0.10	2.21	10.030		9.294	2.600	0.243	0.130	0.200	8.633	0.140				0.100
	(B) Rel-8 Grouped	Cell avg	2.25																	
		Cell-edge	0.07																	
		IoT																		
	(C) Rel-8 Corr	Cell avg	2.25	3.40	3.20	3.46	3.30	3.26		2.97	3.10	3.28	3.47			3.35				
		Cell-edge	0.07	0.242	0.22	0.26	0.24	0.234		0.203	0.215	0.277	0.240			0.232				
		IoT		0.026	0.49	0.10	2.11	9.330		9.395	2.600	0.483	0.160			0.140				
	(D) Rel-8 X-pol uncorr	Cell avg	2.25																	
		Cell-edge	0.07																	
		IoT																		
	(E) Rel-8 X-pol corr	Cell avg	2.25			3.45														
		Cell-edge	0.07			0.26														
		IoT				0.10														
	(A) SU-MIMO 2x4	Cell avg	2.25	4.01		4.31		3.91						4.39						4.65
		Cell-edge	0.07	0.28		0.27		0.265						0.139						0.273
		IoT		0.26		0.10		9.630						0.670						0.500
	(A) CoMP 1x4	Cell avg	2.25	3.42																3.32
		Cell-edge	0.07	0.27																0.239
		IoT		0.26																0.500
	(A) CoMP 2x4	Cell avg	2.25	4.12																4.74
		Cell-edge	0.07	0.28																0.274
		IoT		0.26																0.500
	(C) CoMP 1x4	Cell avg	2.25																	
		Cell-edge	0.07																	
		IoT																		
	(C) CoMP 2x4	Cell avg	2.25																	
		Cell-edge	0.07																	
		IoT																		
	(A) MU-MIMO 1x4	Cell avg	2.25		5.58	6.06														
		Cell-edge	0.07		0.398	0.442														
		IoT																		
	(A) MU-MIMO 2x4	Cell avg	2.25																	
		Cell-edge	0.07																	
		IoT																		
	(C or E) MU-MIMO with 1x8	Cell avg	2.25																	
		Cell-edge	0.07																	
		IoT																		
	(C) MU-MIMO 1x4	Cell avg	2.25																	
		Cell-edge	0.07																	
		IoT																		

Deployment scenario	Indoor Hotspot

	TDD		Requirement	Company1	Company2	Company3	Company4	Company6	Company7	Company8	Company9	Company12	Company16	Company11
Uplink spectral efficiency / IoT	(A) Rel-8 UncorrTDD	Cell avg	2.25	3.40	3.13	3.29	3.18		2.94	2.99	3.12	2.80		3.04
		Cell-edge	0.07	0.25	0.21	0.250	0.23		0.199	0.204	0.259	0.160		0.189
		IoT		0.16	0.42	0.100	2.22		9.345	2.600	0.238	7.945		0.200
	(B) Rel-8 GroupedTDD	Cell avg	2.25											
		Cell-edge	0.07											
		IoT												
	(C) Rel-8 CorrTDD	Cell avg	2.25	3.39	3.09	3.28	3.12		2.92	2.91	3.04			
		Cell-edge	0.07	0.26	0.21	0.250	0.22		0.193	0.191	0.256			
		IoT		0.02	0.48		2.14		9.345	2.600	0.495			
	(D) Rel-8 X-pol uncorrTDD	Cell avg	2.25											
		Cell-edge	0.07											
		IoT												
	(E) Rel-8 X-pol corrTDD	Cell avg	2.25			3.27								
		Cell-edge	0.07			0.249								
		IoT												
	(A) SU-MIMO 2x4TDD	Cell avg	2.25	3.78		3.98								
		Cell-edge	0.07	0.24		0.26								
		IoT		0.29		0.10								
	(A) CoMP 1x4TDD	Cell avg	2.25	3.41										
		Cell-edge	0.07	0.25										
		IoT		0.26										
	(A) CoMP 2x4TDD	Cell avg	2.25	3.84										
		Cell-edge	0.07	0.24										
		IoT		0.25										
	(C) CoMP 1x4TDD	Cell avg	2.25											
		Cell-edge	0.07											
		IoT												
	(C) CoMP 2x4TDD	Cell avg	2.25											
		Cell-edge	0.07											
		IoT												
	(A) MU-MIMO 1x4TDD	Cell avg	2.25		5.36	5.67								
		Cell-edge	0.07		0.374	0.413								
		IoT												
	(A) MU-MIMO 2x4TDD	Cell avg	2.25											
		Cell-edge	0.07											
		IoT												
	(C or E) MU-MIMO with 1x8TDD	Cell avg	2.25											
		Cell-edge	0.07											
		IoT												
	(C) MU-MIMO 1x4	Cell avg	2.25											
		Cell-edge	0.07											
		IoT												

Deployment scenario	Urban Micro-cell

	FDD		Requirement	Company1	Company2	Company3	Company4	Company5	Company6	Company7	Company8	Company9	Company10	Company11	Company12	Company13	Company14	Company15	Company16	Company17
Uplink spectral efficiency/ IoT	(A) Rel-8 Uncorr	Cell avg	1.8	1.93	2.15	2.23	1.92	1.96	1.84	2.06	1.79	2.08	1.73	1.78	1.90	1.91		1.84		1.88
		Cell-edge	0.05	0.078	0.092	0.097	0.079	0.087	0.099	0.059	0.053	0.095	0.072	0.054	0.055	0.069		0.057		0.080
		IoT		5.400	9.980	10.000	9.892	9.870	10.641	11.173	10.000	9.565	8.920	4.160	10.000	6.700		7.060		8.600
	(B) Rel-8 Grouped	Cell avg	1.8																	
		Cell-edge	0.05																	
		IoT																		
	(C) Rel-8 Corr	Cell avg	1.8	1.93	2.09	2.21	1.90	1.92		1.90	1.67	1.98	1.72	1.81	1.80					1.82
		Cell-edge	0.05	0.076	0.088	0.090	0.077	0.077		0.057	0.053	0.086	0.071	0.058	0.065					0.074
		IoT		2.520	9.879	10.000	9.924	9.930		11.139	10.000	9.674	9.100	4.090	10.000					8.900
	(D) Rel-8 X-pol uncorr	Cell avg	1.8																	
		Cell-edge	0.05																	
		IoT																		
	(E) Rel-8 X-pol corr	Cell avg	1.8	2.09	2.45	2.06					2.01	2.41								
		Cell-edge	0.05	0.105	0.097	0.084					0.062	0.122								
		IoT		3.630	9.980	9.000					10.000	8.270								
	(A) SU-MIMO 2x4	Cell avg	1.8	2.23		2.52		2.24					1.93	1.98						2.08
		Cell-edge	0.05	0.087		0.112		0.088					0.075	0.051						0.092
		IoT		6.160		10.000		9.670					9.780	5.530						10.000
	(A) CoMP 1x4	Cell avg	1.8	2.22																2.03
		Cell-edge	0.05	0.093																0.089
		IoT		6.000																8.500
	(A) CoMP 2x4	Cell avg	1.8	2.45																2.18
		Cell-edge	0.05	0.102																0.102
		IoT		6.290																10.000
	(C) CoMP 1x4	Cell avg	1.8																	
		Cell-edge	0.05																	
		IoT																		
	(C) CoMP 2x4	Cell avg	1.8																	
		Cell-edge	0.05																	
		IoT																		
	(A) MU-MIMO 1x4	Cell avg	1.8		2.55	2.37														
		Cell-edge	0.05		0.079	0.074														
		IoT			9.769															
	(A) MU-MIMO 2x4	Cell avg	1.8											2.51						
		Cell-edge	0.05											0.086						
		IoT												7.200						
	(C or E) MU-MIMO with 1x8	Cell avg	1.8																	
		Cell-edge	0.05																	
		IoT																		
	(C) MU-MIMO 1x4	Cell avg	1.8		2.41	2.34														
		Cell-edge	0.05		0.077	0.066														
		IoT			9.986															

Deployment scenario	Urban Micro-cell

	TDD		Requirement	Company1	Company2	Company3	Company4	Company6	Company7	Company8	Company9	Company12	Company16	Company11
Uplink spectral efficiency / IoT	(A) Rel-8 UncorrTDD	Cell avg	1.8	1.82	2.02	2.07	1.82		2.04	1.69	1.91	2.06		1.72
		Cell-edge	0.05	0.073	0.093	0.090	0.075		0.059	0.057	0.087	0.076		0.059
		IoT		5.520	9.740	10.000	9.803		11.367	10.000	9.620	10.120		3.310
	(B) Rel-8 GroupedTDD	Cell avg	1.8											
		Cell-edge	0.05											
		IoT												
	(C) Rel-8 CorrTDD	Cell avg	1.8	1.78	1.99	2.04	1.80		1.89	1.62	1.82	2.00		1.76
		Cell-edge	0.05	0.070	0.090	0.082	0.072		0.056	0.050	0.079	0.070		0.060
		IoT		2.610	9.840	10.000	9.852		11.335	10.000	9.690	10.200		3.240
	(D) Rel-8 X-pol uncorrTDD	Cell avg	1.8											
		Cell-edge	0.05											
		IoT												
	(E) Rel-8 X-pol corrTDD	Cell avg	1.8	1.90	2.31	1.90				2.29	2.22			
		Cell-edge	0.05	0.089	0.092	0.077				0.079	0.119			
		IoT		3.590	9.990	9.000				10.000	8.197			
	(A) SU-MIMO 2x4TDD	Cell avg	1.8	2.12		2.29								1.90
		Cell-edge	0.05	0.081		0.100								0.058
		IoT		6.270		10.000								4.420
	(A) CoMP 1x4TDD	Cell avg	1.8	2.15										
		Cell-edge	0.05	0.083										
		IoT		5.460										
	(A) CoMP 2x4TDD	Cell avg	1.8	2.35										
		Cell-edge	0.05	0.097										
		IoT		6.340										
	(C) CoMP 1x4TDD	Cell avg	1.8											
		Cell-edge	0.05											
		IoT												
	(C) CoMP 2x4TDD	Cell avg	1.8											
		Cell-edge	0.05											
		IoT												
	(A) MU-MIMO 1x4TDD	Cell avg	1.8		2.34	2.21								
		Cell-edge	0.05		0.074	0.068								
		IoT			9.867									
	(A) MU-MIMO 2x4TDD	Cell avg	1.8											2.79
		Cell-edge	0.05											0.068
		IoT												4.250
	(C or E) MU-MIMO with 1x8TDD	Cell avg	1.8		2.97									
		Cell-edge	0.05		0.079									
		IoT			10.020									
	(C) MU-MIMO 1x4	Cell avg	1.8		2.29	2.19								
		Cell-edge	0.05		0.072	0.061								
		IoT			9.764									

Deployment scenario	Urban Macro-cell

	FDD		Requirement	Company1	Company2	Company3	Company4	Company5	Company6	Company7	Company8	Company9	Company10	Company11	Company12	Company13	Company14	Company15	Company16	Company17
Uplink spectral efficiency / IoT	(A) Rel-8 Uncorr	Cell avg	1.4	1.55	1.59	1.74	1.53	1.57	1.44	1.56	1.48	1.79	1.55		1.43	1.56				1.42
		Cell-edge	0.03	0.078	0.072	0.075	0.071	0.075	0.067	0.063	0.059	0.086	0.056		0.060	0.067				0.065
		IoT		5.140	8.740	9.000	9.822	9.840	8.079	10.414	10.000	9.874	7.800		10.440	6.500				9.400
	(B) Rel-8 Grouped	Cell avg	1.4																	
		Cell-edge	0.03																	
		IoT																		
	(C) Rel-8 Corr	Cell avg	1.4	1.50	1.57	1.67	1.48	1.45		1.49	1.41	1.69	1.52	1.51	1.40					1.40
		Cell-edge	0.03	0.077	0.069	0.073	0.070	0.070		0.060	0.054	0.077	0.045	0.046	0.046					0.061
		IoT		2.380	8.360	9.000	9.562	9.560		10.414	10.000	9.965	7.730	4.940	10.270					9.400
	(D) Rel-8 X-pol uncorr	Cell avg	1.4																	
		Cell-edge	0.03																	
		IoT																		
	(E) Rel-8 X-pol corr	Cell avg	1.4	1.51	1.88	1.54					1.95	2.04								
		Cell-edge	0.03	0.081	0.075	0.068					0.072	0.108								
		IoT		3.210	9.950	8.000					8.500	8.172								
	(A) SU-MIMO 2x4	Cell avg	1.4	1.77		1.93		1.75						1.62						1.62
		Cell-edge	0.03	0.086		0.087		0.082						0.046						0.072
		IoT		5.300		9.000		9.920						5.810						9.900
	(A) CoMP 1x4	Cell avg	1.4	1.95																1.51
		Cell-edge	0.03	0.096																0.075
		IoT		5.046																9.300
	(A) CoMP 2x4	Cell avg	1.4	2.11																1.74
		Cell-edge	0.03	0.102																0.081
		IoT		5.380																9.900
	(C) CoMP 1x4	Cell avg	1.4	1.89																
		Cell-edge	0.03	0.095																
		IoT		5.046																
	(C) CoMP 2x4	Cell avg	1.4	2.05																
		Cell-edge	0.03	0.099																
		IoT		5.380																
	(A) MU-MIMO 1x4	Cell avg	1.4		2.07	1.84														
		Cell-edge	0.03		0.068	0.066														
		IoT			9.670															
	(A) MU-MIMO 2x4	Cell avg	1.4											1.91						
		Cell-edge	0.03											0.069						
		IoT												7.500						
	(C or E) MU-MIMO with 1x8	Cell avg	1.4																	
		Cell-edge	0.03																	
		IoT																		
	(C) MU-MIMO 1x4	Cell avg	1.4		1.94	1.75														
		Cell-edge	0.03		0.065	0.063														
		IoT			9.786															

Deployment scenario	Urban Macro-cell

	TDD		Requirement	Company1	Company2	Company3	Company4	Company6	Company7	Company8	Company9	Company12	Company16	Company11
Uplink spectral efficiency/ IoT	Cell avgTDD	Cell avg	1.4	1.51	1.56	1.62	1.45		1.55	1.43	1.66	1.41		
		Cell-edge	0.03	0.075	0.068	0.070	0.069		0.062	0.050	0.079	0.048		
		IoT		5.120	9.990	9.000	9.787		10.607	10.000	9.892	10.590		
	Cell avgTDD	Cell avg	1.4											
		Cell-edge	0.03											
		IoT												
	Cell avgTDD	Cell avg	1.4	1.42	1.53	1.56	1.41		1.48	1.32	1.55	1.40		1.44
		Cell-edge	0.03	0.074	0.062	0.068	0.066		0.059	0.050	0.071	0.050		0.055
		IoT		2.430	9.870	9.000	9.523		10.607	10.000	9.970	11.110		4.120
	Cell avgTDD	Cell avg	1.4											
		Cell-edge	0.03											
		IoT												
	Cell avgTDD	Cell avg	1.4	1.44	1.85	1.44					1.89			
		Cell-edge	0.03	0.075	0.074	0.063					0.101			
		IoT		3.300	9.630	8.000					8.161			
	Cell avgTDD	Cell avg	1.4	1.73		1.76								1.54
		Cell-edge	0.03	0.083		0.076								0.059
		IoT		5.400		9.000								4.810
	Cell avgTDD	Cell avg	1.4	1.89										
		Cell-edge	0.03	0.093										
		IoT		5.100										
	Cell avgTDD	Cell avg	1.4	2.06										
		Cell-edge	0.03	0.100										
		IoT		5.360										
	Cell avgTDD	Cell avg	1.4	1.86										
		Cell-edge	0.03	0.090										
		IoT		5.100										
	Cell avgTDD	Cell avg	1.4	2.00										
		Cell-edge	0.03	0.097										
		IoT		5.360										
	Cell avgTDD	Cell avg	1.4		1.96	1.72								
		Cell-edge	0.03		0.064	0.061								
		IoT			9.540									
	Cell avgTDD	Cell avg	1.4											
		Cell-edge	0.03											
		IoT												
	Cell avgTDD	Cell avg	1.4		2.74									
		Cell-edge	0.03		0.076									
		IoT			9.910									
	(C) MU-MIMO 1x4	Cell avg	1.4		1.87	1.63								
		Cell-edge	0.03		0.062	0.058								
		IoT			9.734									

Deployment scenario	Rural Macro-cell

	FDD		Requirement	Company1	Company2	Company3	Company4	Company5	Company6	Company7	Company8	Company9	Company10	Company11	Company12	Company13	Company14	Company15	Company16	Company17
Uplink spectral efficiency / IoT	(A) Rel-8 Uncorr	Cell avg	0.7	1.87	1.93	2.16	1.89	1.75	1.75	1.64	1.78	2.03	1.87		1.62	1.88				1.62
		Cell-edge	0.015	0.104	0.105	0.109	0.104	0.092	0.082	0.056	0.088	0.101	0.080		0.072	0.106				0.075
		IoT		4.850	9.353	10.000	9.772	9.800	10.156	10.294	8.000	9.482	7.050		9.590	9.800				9.000
	(B) Rel-8 Grouped	Cell avg	0.7																	
		Cell-edge	0.015																	
		IoT																		
	(C) Rel-8 Corr	Cell avg	0.7	1.85	1.95	2.08	1.84	1.72		1.60	1.60	1.88	1.82	1.83						1.54
		Cell-edge	0.015	0.100	0.108	0.099	0.100	0.091		0.054	0.074	0.084	0.066	0.058						0.065
		IoT		1.930	9.564	10.000	9.633	9.100		10.334	8.000	9.691	7.300	4.150						9.100
	(D) Rel-8 X-pol uncorr	Cell avg	0.7																	
		Cell-edge	0.015																	
		IoT																		
	(E) Rel-8 X-pol corr	Cell avg	0.7	1.74	2.37	1.97					1.95	2.21								
		Cell-edge	0.015	0.100	0.118	0.097					0.090	0.113								
		IoT		3.130	9.332	9.000					8.000	7.456								
	(A) SU-MIMO 2x4	Cell avg	0.7	2.32		2.45		2.27						1.90						1.90
		Cell-edge	0.015	0.129		0.129		0.126						0.062						0.086
		IoT		9.020		10.000		9.370						4.700						9.800
	(A) CoMP 1x4	Cell avg	0.7	2.31																1.75
		Cell-edge	0.015	0.129																0.086
		IoT		8.560																9.000
	(A) CoMP 2x4	Cell avg	0.7	2.58																2.02
		Cell-edge	0.015	0.154																0.098
		IoT		9.020																9.800
	(C) CoMP 1x4	Cell avg	0.7																	
		Cell-edge	0.015																	
		IoT																		
	(C) CoMP 2x4	Cell avg	0.7																	
		Cell-edge	0.015																	
		IoT																		
	(A) MU-MIMO 1x4	Cell avg	0.7		2.19	2.28														
		Cell-edge	0.015		0.097	0.098														
		IoT			9.945															
	(A) MU-MIMO 2x4	Cell avg	0.7																	
		Cell-edge	0.015																	
		IoT																		
	(C or E) MU-MIMO with 1x8	Cell avg	0.7																	
		Cell-edge	0.015																	
		IoT																		
	(C) MU-MIMO 1x4	Cell avg	0.7		2.14	2.19														
		Cell-edge	0.015		0.093	0.087														
		IoT			9.832															

Deployment scenario	Rural Macro-cell

	TDD		Requirement	Company1	Company2	Company3	Company4	Company6	Company7	Company8	Company9	Company12	Company16	Company11
Uplink spectral efficiency / IoT	(A) Rel-8 UncorrTDD	Cell avg	0.7	1.90	1.88	2.02	1.80		1.64	1.74	1.88	1.55		
		Cell-edge	0.015	0.103	0.099	0.101	0.099		0.056	0.087	0.094	0.070		
		IoT		4.780	9.690	10.000	9.728		10.531	8.000	9.493	9.550		
	(B) Rel-8 GroupedTDD	Cell avg	0.7											
		Cell-edge	0.015											
		IoT												
	(C) Rel-8 CorrTDD	Cell avg	0.7	1.80	1.84	1.94	1.76		1.59	1.58	1.76			1.96
		Cell-edge	0.015	0.095	0.098	0.091	0.094		0.054	0.075	0.078			0.052
		IoT		1.890	9.970	10.000	9.773		10.569	8.000	9.684			4.080
	(D) Rel-8 X-pol uncorrTDD	Cell avg	0.7											
		Cell-edge	0.015											
		IoT												
	(E) Rel-8 X-pol corrTDD	Cell avg	0.7	1.70	2.21	1.89					2.05			
		Cell-edge	0.015	0.094	0.112	0.093					0.106			
		IoT		3.180	9.780	9.000					7.403			
	(A) SU-MIMO 2x4TDD	Cell avg	0.7	2.25		2.27								
		Cell-edge	0.015	0.127		0.118								
		IoT		9.020		9.000								
	(A) CoMP 1x4TDD	Cell avg	0.7	2.23										
		Cell-edge	0.015	0.125										
		IoT		8.390										
	(A) CoMP 2x4TDD	Cell avg	0.7	2.52										
		Cell-edge	0.015	0.153										
		IoT		9.050										
	(C) CoMP 1x4TDD	Cell avg	0.7											
		Cell-edge	0.015											
		IoT												
	(C) CoMP 2x4TDD	Cell avg	0.7											
		Cell-edge	0.015											
		IoT												
	(A) MU-MIMO 1x4TDD	Cell avg	0.7		2.06	2.13								
		Cell-edge	0.015		0.094	0.091								
		IoT			9.894									
	(A) MU-MIMO 2x4TDD	Cell avg	0.7											
		Cell-edge	0.015											
		IoT												
	(C or E) MU-MIMO with 1x8TDD	Cell avg	0.7		2.64									
		Cell-edge	0.015		0.101									
		IoT			10.110									
	(C) MU-MIMO 1x4	Cell avg	0.7		2.01	2.05								
		Cell-edge	0.015		0.089	0.081								
		IoT			9.798									

Mobility Evaluation

Parameter	Baseline value	Company 1	Company 2	Company 3	Company 4	Company 5	Company 6	Company 7
Power control	Fractional (α = 0.8), P_0 fitted to environment	P0 fitted to environment with target of average IoT <=10dB	Fractional (α = 0.8), P_0 fitted to environment	Fractional (α = 0.8), P_0 fitted to environment, IoT<=10dB	Fractional (α = 0.8), P_0 fitted to environment, IoT<=10dB	Fractional (α = 0.8), P_0 fitted to environment, IoT<=10dB	Fractional (a = 0.8), P_0 fitted to environment, IoT<=10dB	Fractional (α = 0.8), P_0 fitted to environment
Scheduling bandwidth	4-5 RB	5RB	5 RB	5RB	5RB	5RB	5RB	5 RB
Overhead		Same as full buffer simualtion		Same as full buffer simualtion	Same as full buffer simualtion	Same as full buffer simualtion	Same as full buffer simualtion	

				InH			
	Company1	Company2	Company3	Company4	Company7	Company5	Company6
Median SINR	14.28	15.25	13.66	13.60	14.95	12.79	12.69
Percentile							
0.00	-6.35	-0.12	-4.41	-6.8585	7.49	-6.7811	-6.68
1.00	-0.15	2.44	-0.14	0.082093	8.27	-2.3547	-2.15
2.00	0.79	3.50	0.79	1.1153	8.87	-1.3518	-1.40
3.00	1.38	4.14	1.42	1.7947	9.20	-0.6986	-0.63
4.00	2.00	4.73	1.90	2.3161	9.48	-0.2276	-0.15
5.00	2.39	4.98	2.37	2.7912	9.86	0.1881	0.39
6.00	2.79	5.51	2.80	3.1987	10.00	0.6464	0.70
7.00	3.14	6.12	3.14	3.5793	10.15	1.1048	1.00
8.00	3.61	6.30	3.46	3.9121	10.35	1.4881	1.54
9.00	3.88	6.95	3.73	4.2363	10.53	1.8006	1.77
10.00	4.21	7.52	4.04	4.5103	10.74	2.0861	1.95
11.00	4.46	7.69	4.36	4.7783	11.03	2.4347	2.49
12.00	4.72	8.13	4.68	5.0438	11.20	2.7581	2.81
13.00	4.99	8.42	5.00	5.2939	11.34	3.085	2.97
14.00	5.20	8.58	5.31	5.5299	11.47	3.453	3.45
15.00	5.46	8.71	5.58	5.7736	11.67	3.6858	3.59
16.00	5.76	8.90	5.82	6.0012	11.75	3.8956	3.93
17.00	6.01	9.10	6.06	6.2462	11.88	4.0992	4.31
18.00	6.22	9.24	6.24	6.4734	12.00	4.2697	4.41
19.00	6.44	9.49	6.45	6.7138	12.13	4.4315	4.34
20.00	6.68	9.68	6.64	6.9186	12.24	4.6399	4.49
21.00	6.88	10.12	6.85	7.1156	12.39	4.8555	4.88
22.00	7.17	10.36	7.04	7.328	12.53	5.0336	5.21
23.00	7.37	10.67	7.30	7.5388	12.67	5.2716	5.20
24.00	7.55	10.79	7.46	7.7624	12.71	5.4459	5.44
25.00	7.69	11.05	7.65	7.9754	12.82	5.7184	5.67
26.00	7.90	11.39	7.83	8.1829	12.94	6.0749	6.10
27.00	8.11	11.45	8.02	8.395	13.07	6.3233	6.37
28.00	8.32	11.55	8.20	8.5879	13.17	6.5631	6.49
29.00	8.51	11.75	8.41	8.7927	13.28	6.745	6.82
30.00	8.79	12.04	8.63	8.989	13.33	6.9917	7.04
31.00	8.99	12.15	8.86	9.2009	13.45	7.2341	7.09
32.00	9.19	12.23	9.13	9.4078	13.49	7.4333	7.48
33.00	9.42	12.56	9.31	9.6127	13.58	7.7028	7.67
34.00	9.68	12.90	9.61	9.8057	13.67	7.9467	7.69
35.00	9.93	13.05	9.84	10.013	13.74	8.1811	7.96
36.00	10.18	13.39	10.11	10.215	13.82	8.4962	8.33
37.00	10.46	13.57	10.29	10.443	13.87	8.789	8.87
38.00	10.74	13.66	10.59	10.663	13.97	9.0665	9.07
39.00	10.98	13.75	10.80	10.879	14.05	9.4228	9.58
40.00	11.27	13.80	11.01	11.105	14.10	9.7165	9.66
41.00	11.50	14.13	11.25	11.33	14.19	10.0761	10.08
42.00	11.76	14.23	11.49	11.576	14.27	10.3234	10.39
43.00	12.06	14.32	11.72	11.814	14.32	10.6355	10.65
44.00	12.36	14.52	11.96	12.039	14.40	10.9252	10.85
45.00	12.63	14.58	12.20	12.289	14.49	11.2464	11.18
46.00	12.97	14.77	12.47	12.523	14.59	11.5118	11.47
47.00	13.31	14.83	12.70	12.803	14.69	11.766	11.67
48.00	13.66	14.89	13.00	13.057	14.76	12.0133	12.10
49.00	13.94	15.03	13.31	13.334	14.83	12.5001	12.41
50.00	14.28	15.25	13.66	13.596	14.95	12.7879	12.69
51.00	14.53	15.47	13.95	13.868	15.07	13.052	12.96
52.00	14.85	15.51	14.24	14.136	15.17	13.4075	13.28
53.00	15.12	15.67	14.53	14.385	15.32	13.6566	13.69
54.00	15.32	15.80	14.85	14.662	15.44	14.0415	14.03
55.00	15.56	15.95	15.11	14.921	15.54	14.262	14.23
56.00	15.86	16.00	15.33	15.171	15.65	14.4831	14.17
57.00	16.13	16.22	15.59	15.42	15.74	14.6313	14.61
58.00	16.39	16.24	15.80	15.686	15.87	14.7867	14.71
59.00	16.75	16.48	16.09	15.966	15.98	14.8681	15.03
60.00	16.96	16.62	16.33	16.219	16.11	14.942	15.13
61.00	17.17	16.71	16.52	16.472	16.25	15.0422	14.96
62.00	17.40	16.90	16.76	16.736	16.34	15.1298	15.26
63.00	17.64	16.97	16.92	16.958	16.48	15.2326	15.06
64.00	17.80	17.13	17.07	17.171	16.56	15.3252	15.43
65.00	17.94	17.24	17.26	17.366	16.70	15.4505	15.59
66.00	18.07	17.54	17.42	17.538	16.75	15.5415	15.41
67.00	18.19	17.79	17.55	17.711	16.86	15.6122	15.67
68.00	18.29	18.06	17.71	17.864	16.96	15.694	15.79
69.00	18.38	18.13	17.84	17.995	17.02	15.7588	15.77
70.00	18.47	18.37	17.95	18.112	17.12	15.8343	15.79
71.00	18.58	18.43	18.05	18.22	17.26	15.8938	15.82
72.00	18.65	18.69	18.19	18.323	17.40	15.9761	16.03
73.00	18.73	18.78	18.32	18.408	17.56	16.0586	16.06
74.00	18.78	19.03	18.40	18.491	17.66	16.1166	16.14
75.00	18.85	19.13	18.50	18.57	17.81	16.1712	16.18
76.00	18.91	19.26	18.58	18.652	17.93	16.2243	16.30
77.00	18.97	19.59	18.64	18.722	18.04	16.2582	16.45
78.00	19.05	19.65	18.72	18.791	18.17	16.3103	16.45
79.00	19.10	19.90	18.77	18.861	18.24	16.3492	16.44
80.00	19.16	20.19	18.88	18.921	18.53	16.3904	16.48
81.00	19.23	20.35	18.96	18.985	18.69	16.435	16.38
82.00	19.29	20.42	19.01	19.052	18.87	16.4744	16.64
83.00	19.35	20.69	19.09	19.116	18.95	16.5354	16.33
84.00	19.43	20.90	19.14	19.177	19.08	16.5828	16.60
85.00	19.49	21.23	19.19	19.253	19.28	16.6394	16.81
86.00	19.57	21.58	19.27	19.32	19.47	16.662	16.82
87.00	19.63	21.73	19.33	19.393	19.60	16.7143	16.82
88.00	19.68	21.96	19.41	19.466	19.75	16.7794	16.80
89.00	19.77	22.19	19.48	19.551	19.96	16.8891	16.96
90.00	19.83	22.25	19.56	19.628	20.25	17.0607	17.07
91.00	19.93	22.49	19.67	19.718	20.47	17.6819	17.67
92.00	19.99	22.67	19.72	19.813	20.66	18.2192	18.11
93.00	20.10	22.78	19.78	19.921	20.95	18.963	19.03
94.00	20.19	22.86	19.86	20.042	21.28	19.4844	19.31
95.00	20.32	23.37	19.96	20.166	21.55	20.1076	20.20
96.00	20.46	23.41	20.09	20.319	22.06	20.7471	20.52
97.00	20.63	23.60	20.23	20.511	22.59	22.0252	22.12
98.00	20.98	24.15	20.57	20.762	23.62	23.0925	23.11
99.00	21.27	24.37	20.97	21.168	27.80	25.5239	25.64
100.00	23.06	25.52	22.84	24.286	27.91	28.0852	28.09

				UMi			
	Company1	Company2	Company3	Company4	Company7	Company5	Company6
Median SINR	4.48	3.59	4.75	5.24	5.63	4.07	4.01
Percentile							
0.00	-13.35	-8.75	-18.58	-13.26	-11.28	-17.9631	-18.16
1.00	-7.84	-5.39	-8.24	-7.43	-9.09	-9.2596	-9.16
2.00	-5.92	-4.71	-6.65	-5.90	-7.72	-7.5559	-7.52
3.00	-5.28	-4.20	-5.74	-5.08	-6.04	-6.5149	-6.66
4.00	-4.71	-3.98	-5.02	-4.39	-4.54	-5.7277	-5.93
5.00	-4.13	-3.48	-4.41	-3.82	-3.72	-5.1204	-5.02
6.00	-3.52	-3.11	-3.88	-3.26	-2.46	-4.5782	-4.48
7.00	-3.09	-2.80	-3.39	-2.85	-1.86	-4.0782	-4.05
8.00	-2.80	-2.42	-2.97	-2.43	-1.20	-3.6098	-3.52
9.00	-2.47	-2.10	-2.63	-2.10	-0.61	-3.2155	-3.17
10.00	-2.14	-1.89	-2.29	-1.78	-0.18	-2.8526	-2.86
11.00	-1.80	-1.66	-1.99	-1.46	0.16	-2.528	-2.56
12.00	-1.54	-1.48	-1.69	-1.17	0.49	-2.2357	-2.24
13.00	-1.35	-1.33	-1.42	-0.91	0.81	-1.9528	-1.97
14.00	-1.11	-1.11	-1.16	-0.64	0.99	-1.7108	-1.83
15.00	-0.87	-1.01	-0.93	-0.42	1.25	-1.4664	-1.62
16.00	-0.66	-0.77	-0.66	-0.19	1.48	-1.2576	-1.19
17.00	-0.44	-0.69	-0.47	0.00	1.61	-1.0347	-0.94
18.00	-0.26	-0.51	-0.25	0.22	1.72	-0.8066	-0.97
19.00	-0.07	-0.39	-0.02	0.42	1.89	-0.5827	-0.48
20.00	0.09	-0.24	0.17	0.62	2.11	-0.3636	-0.47
21.00	0.28	0.05	0.36	0.82	2.29	-0.1536	-0.12
22.00	0.49	0.21	0.55	1.02	2.42	0.0447	-0.01
23.00	0.65	0.38	0.74	1.19	2.58	0.2517	0.35
24.00	0.85	0.52	0.93	1.37	2.70	0.4271	0.42
25.00	1.03	0.66	1.08	1.54	2.82	0.603	0.53
26.00	1.16	0.75	1.27	1.70	2.94	0.7764	0.81
27.00	1.34	0.90	1.42	1.86	3.03	0.9338	0.99
28.00	1.46	0.97	1.61	2.03	3.13	1.0967	1.14
29.00	1.66	1.11	1.76	2.19	3.30	1.2411	1.30
30.00	1.82	1.21	1.91	2.33	3.43	1.3963	1.38
31.00	1.97	1.36	2.10	2.49	3.57	1.5507	1.47
32.00	2.05	1.43	2.25	2.64	3.67	1.6944	1.65
33.00	2.21	1.60	2.40	2.82	3.78	1.838	1.89
34.00	2.38	1.70	2.55	2.98	3.86	1.9904	1.98
35.00	2.52	1.82	2.71	3.12	3.98	2.1432	2.31
36.00	2.70	1.95	2.82	3.27	4.14	2.2825	2.28
37.00	2.81	2.10	2.97	3.42	4.23	2.4239	2.43
38.00	2.96	2.22	3.12	3.57	4.36	2.5617	2.68
39.00	3.07	2.32	3.27	3.72	4.49	2.6989	2.69
40.00	3.24	2.41	3.39	3.86	4.62	2.827	2.85
41.00	3.38	2.52	3.54	4.00	4.74	2.9606	3.02
42.00	3.51	2.60	3.69	4.15	4.84	3.0948	3.09
43.00	3.66	2.69	3.80	4.29	4.93	3.2213	3.22
44.00	3.77	2.75	3.96	4.43	5.04	3.3441	3.41
45.00	3.89	2.88	4.07	4.56	5.10	3.4656	3.39
46.00	3.97	2.99	4.22	4.69	5.19	3.5838	3.41
47.00	4.14	3.10	4.33	4.83	5.31	3.7103	3.76
48.00	4.27	3.26	4.49	4.96	5.42	3.8312	3.77
49.00	4.36	3.47	4.64	5.10	5.52	3.9545	3.92
50.00	4.48	3.59	4.75	5.24	5.63	4.0725	4.01
51.00	4.62	3.79	4.87	5.37	5.71	4.1952	4.09
52.00	4.73	3.95	5.02	5.51	5.81	4.3236	4.33
53.00	4.87	4.06	5.13	5.65	5.91	4.4502	4.62
54.00	4.95	4.17	5.28	5.78	6.03	4.574	4.47
55.00	5.09	4.25	5.40	5.93	6.16	4.6942	4.93
56.00	5.26	4.34	5.55	6.07	6.30	4.8201	4.87
57.00	5.36	4.45	5.66	6.21	6.39	4.9465	4.98
58.00	5.49	4.60	5.81	6.33	6.45	5.0701	4.97
59.00	5.64	4.73	5.93	6.48	6.55	5.1957	5.17
60.00	5.77	4.85	6.04	6.63	6.63	5.3155	5.39
61.00	5.97	4.95	6.19	6.75	6.73	5.4417	5.54
62.00	6.10	5.21	6.30	6.90	6.86	5.5727	5.66
63.00	6.28	5.34	6.46	7.02	7.04	5.6937	5.86
64.00	6.42	5.44	6.57	7.17	7.12	5.8224	5.81
65.00	6.49	5.66	6.72	7.29	7.23	5.9567	6.28
66.00	6.65	5.75	6.83	7.43	7.36	6.0887	6.05
67.00	6.76	5.90	6.99	7.57	7.48	6.2138	6.22
68.00	6.89	6.03	7.14	7.71	7.57	6.3474	6.38
69.00	7.03	6.20	7.25	7.86	7.78	6.4684	6.43
70.00	7.21	6.29	7.40	8.01	7.89	6.6018	6.48
71.00	7.35	6.43	7.55	8.16	8.04	6.7374	6.85
72.00	7.46	6.52	7.71	8.32	8.19	6.8792	6.91
73.00	7.61	6.69	7.82	8.45	8.35	7.0249	7.10
74.00	7.75	6.80	7.97	8.59	8.51	7.1823	7.11
75.00	7.89	6.92	8.12	8.75	8.67	7.3487	7.34
76.00	8.05	7.09	8.27	8.92	8.81	7.5119	7.57
77.00	8.19	7.37	8.43	9.09	9.00	7.6779	7.63
78.00	8.32	7.59	8.58	9.24	9.08	7.8459	8.04
79.00	8.43	7.76	8.77	9.39	9.29	8.0196	8.18
80.00	8.59	7.97	8.92	9.57	9.45	8.2069	8.15
81.00	8.75	8.11	9.07	9.76	9.58	8.3957	8.30
82.00	8.96	8.23	9.26	9.95	9.81	8.5892	8.56
83.00	9.06	8.54	9.45	10.14	9.98	8.7893	8.90
84.00	9.21	8.77	9.64	10.36	10.10	9.0105	8.95
85.00	9.40	8.97	9.83	10.57	10.23	9.2509	9.28
86.00	9.66	9.14	10.02	10.76	10.37	9.5223	9.50
87.00	9.83	9.28	10.21	11.00	10.55	9.7858	9.77
88.00	10.01	9.51	10.43	11.24	10.68	10.0929	10.18
89.00	10.23	9.76	10.66	11.49	10.92	10.432	10.30
90.00	10.48	10.04	10.92	11.74	11.11	10.8223	11.05
91.00	10.73	10.26	11.15	12.01	11.26	11.3074	11.23
92.00	10.89	10.71	11.45	12.27	11.48	11.8565	11.96
93.00	11.20	11.00	11.72	12.57	11.67	12.5123	12.58
94.00	11.60	11.14	12.06	12.97	11.87	13.2998	13.31
95.00	11.96	11.50	12.40	13.36	12.06	14.4282	14.43
96.00	12.42	11.85	12.78	13.82	12.39	15.8059	15.89
97.00	12.95	12.35	13.23	14.40	12.81	17.455	17.54
98.00	13.31	12.89	13.80	15.06	13.45	19.1987	19.25
99.00	14.14	13.64	14.64	16.20	15.01	21.5492	21.46
100.00	16.79	16.76	19.29	22.69	15.03	33.2677	33.16

				UMa			
	Company1	Company2	Company3	Company4	Company7	Company5	Company6
Median SINR	4.00	4.02	4.00	4.87	5.35	3.87	3.96
Percentile							
0.00	-13.26	-9.65	-13.26	-11.94	-8.94	-10.98	-11.05
1.00	-5.99	-4.66	-5.99	-5.34	-7.01	-6.14	-6.20
2.00	-4.88	-3.45	-4.88	-4.22	-5.46	-4.79	-4.80
3.00	-4.16	-2.30	-4.16	-3.49	-4.83	-3.89	-3.87
4.00	-3.56	-1.71	-3.56	-2.97	-4.13	-3.35	-3.41
5.00	-3.08	-1.41	-3.08	-2.56	-3.28	-2.97	-3.06
6.00	-2.70	-1.18	-2.70	-2.19	-2.44	-2.58	-2.59
7.00	-2.35	-0.96	-2.35	-1.81	-1.77	-2.23	-2.32
8.00	-2.04	-0.55	-2.04	-1.53	-1.19	-1.94	-1.78
9.00	-1.75	-0.34	-1.75	-1.25	-0.67	-1.72	-1.91
10.00	-1.47	-0.16	-1.47	-0.99	0.18	-1.49	-1.56
11.00	-1.25	-0.02	-1.25	-0.76	0.42	-1.29	-1.12
12.00	-1.03	0.13	-1.03	-0.55	0.85	-1.07	-1.22
13.00	-0.81	0.35	-0.81	-0.34	1.24	-0.88	-0.91
14.00	-0.58	0.53	-0.58	-0.17	1.57	-0.70	-0.72
15.00	-0.40	0.68	-0.40	0.06	1.92	-0.54	-0.56
16.00	-0.24	0.88	-0.24	0.26	2.21	-0.36	-0.45
17.00	-0.05	0.98	-0.05	0.44	2.37	-0.19	-0.17
18.00	0.11	1.12	0.11	0.63	2.50	-0.02	0.02
19.00	0.27	1.25	0.27	0.77	2.58	0.16	0.23
20.00	0.43	1.34	0.43	0.94	2.69	0.31	0.50
21.00	0.58	1.49	0.58	1.12	2.85	0.45	0.32
22.00	0.74	1.55	0.74	1.27	2.98	0.59	0.63
23.00	0.87	1.68	0.87	1.42	3.15	0.73	0.89
24.00	1.03	1.74	1.03	1.57	3.28	0.87	0.81
25.00	1.15	1.87	1.15	1.72	3.38	1.00	0.83
26.00	1.31	1.96	1.31	1.85	3.50	1.12	0.89
27.00	1.44	2.04	1.44	2.00	3.55	1.26	1.23
28.00	1.56	2.19	1.56	2.14	3.60	1.39	1.49
29.00	1.69	2.27	1.69	2.28	3.68	1.52	1.30
30.00	1.82	2.34	1.82	2.41	3.77	1.65	1.65
31.00	1.94	2.41	1.94	2.54	3.90	1.77	1.62
32.00	2.04	2.47	2.04	2.68	3.95	1.90	1.97
33.00	2.16	2.56	2.16	2.82	4.01	2.01	2.07
34.00	2.29	2.66	2.29	2.94	4.07	2.13	2.09
35.00	2.39	2.79	2.39	3.06	4.18	2.24	2.28
36.00	2.51	2.84	2.51	3.18	4.24	2.36	2.27
37.00	2.64	2.94	2.64	3.30	4.36	2.48	2.57
38.00	2.73	3.03	2.73	3.42	4.41	2.60	2.60
39.00	2.86	3.09	2.86	3.55	4.48	2.71	2.63
40.00	2.96	3.15	2.96	3.69	4.55	2.82	2.96
41.00	3.05	3.25	3.05	3.81	4.65	2.93	2.98
42.00	3.18	3.36	3.18	3.94	4.72	3.03	2.97
43.00	3.27	3.46	3.27	4.06	4.77	3.13	3.21
44.00	3.40	3.57	3.40	4.17	4.86	3.24	3.17
45.00	3.49	3.64	3.49	4.30	4.94	3.34	3.31
46.00	3.59	3.73	3.59	4.44	5.03	3.44	3.57
47.00	3.68	3.81	3.68	4.54	5.08	3.55	3.38
48.00	3.81	3.85	3.81	4.64	5.15	3.65	3.71
49.00	3.90	3.93	3.90	4.75	5.28	3.77	3.79
50.00	4.00	4.02	4.00	4.87	5.35	3.87	3.96
51.00	4.09	4.13	4.09	4.98	5.46	3.97	4.04
52.00	4.22	4.21	4.22	5.10	5.54	4.07	3.91
53.00	4.31	4.31	4.31	5.21	5.61	4.16	4.11
54.00	4.41	4.40	4.41	5.33	5.70	4.25	4.14
55.00	4.50	4.49	4.50	5.45	5.78	4.35	4.44
56.00	4.60	4.57	4.60	5.56	5.86	4.44	4.34
57.00	4.72	4.72	4.72	5.68	5.92	4.54	4.68
58.00	4.82	4.80	4.82	5.80	6.00	4.64	4.51
59.00	4.91	4.94	4.91	5.92	6.07	4.75	4.78
60.00	5.01	5.07	5.01	6.04	6.18	4.85	5.04
61.00	5.14	5.13	5.14	6.17	6.30	4.95	4.96
62.00	5.23	5.18	5.23	6.30	6.37	5.06	5.25
63.00	5.33	5.27	5.33	6.41	6.47	5.17	5.19
64.00	5.42	5.35	5.42	6.54	6.61	5.27	5.37
65.00	5.55	5.44	5.55	6.67	6.70	5.37	5.32
66.00	5.64	5.57	5.64	6.78	6.77	5.48	5.45
67.00	5.74	5.66	5.74	6.90	6.88	5.59	5.70
68.00	5.86	5.77	5.86	7.03	7.03	5.69	5.69
69.00	5.96	5.89	5.96	7.15	7.12	5.79	5.75
70.00	6.08	5.99	6.08	7.29	7.27	5.90	5.79
71.00	6.21	6.09	6.21	7.42	7.42	6.01	5.98
72.00	6.31	6.18	6.31	7.55	7.53	6.13	6.08
73.00	6.43	6.30	6.43	7.69	7.63	6.25	6.10
74.00	6.56	6.43	6.56	7.83	7.75	6.36	6.31
75.00	6.68	6.56	6.68	7.97	7.81	6.48	6.59
76.00	6.81	6.62	6.81	8.12	8.00	6.61	6.72
77.00	6.94	6.75	6.94	8.27	8.09	6.75	6.67
78.00	7.06	6.92	7.06	8.42	8.23	6.89	6.97
79.00	7.22	7.00	7.22	8.58	8.45	7.04	7.02
80.00	7.35	7.13	7.35	8.73	8.59	7.19	7.19
81.00	7.51	7.22	7.51	8.90	8.68	7.35	7.24
82.00	7.66	7.38	7.66	9.06	8.84	7.52	7.37
83.00	7.82	7.51	7.82	9.22	8.93	7.70	7.73
84.00	7.98	7.62	7.98	9.41	9.12	7.88	7.95
85.00	8.14	7.76	8.14	9.61	9.27	8.06	7.93
86.00	8.33	7.95	8.33	9.81	9.42	8.25	8.21
87.00	8.52	8.09	8.52	10.00	9.57	8.46	8.43
88.00	8.71	8.27	8.71	10.23	9.72	8.69	8.78
89.00	8.90	8.56	8.90	10.41	9.91	8.92	8.80
90.00	9.12	8.74	9.12	10.61	10.12	9.17	9.28
91.00	9.37	8.95	9.37	10.85	10.26	9.42	9.42
92.00	9.62	9.21	9.62	11.16	10.51	9.72	9.69
93.00	9.91	9.42	9.91	11.46	10.74	10.03	9.88
94.00	10.22	9.88	10.22	11.80	10.84	10.37	10.38
95.00	10.57	10.41	10.57	12.22	11.15	10.75	10.97
96.00	10.95	10.69	10.95	12.63	11.35	11.22	11.20
97.00	11.43	11.17	11.43	13.18	11.66	11.70	11.59
98.00	11.99	11.51	11.99	13.81	12.08	12.43	12.38
99.00	12.85	12.64	12.85	14.91	13.65	13.75	13.74
100.00	18.35	15.47	18.35	19.65	14.02	25.82	25.57

				RMa			
	Company1	Company2	Company3	Company4	Company7	Company5	Company6
Median SINR	5.24	5.46	5.24	5.96	6.34	4.93	4.77
Percentile							
0.00	-12.48	-6.21	-12.48	-11.9845009	-4.87	-10.2738	-10.35
1.00	-4.91	-3.46	-4.91	-4.6960464	0.09	-4.4124	-4.44
2.00	-3.84	-2.64	-3.84	-3.5068517	1.10	-3.5559	-3.69
3.00	-3.13	-1.53	-3.13	-2.6237125	1.45	-3.0359	-3.08
4.00	-2.58	-1.01	-2.58	-2.1715989	1.77	-2.5974	-2.53
5.00	-2.12	-0.53	-2.12	-1.7452193	2.01	-2.2322	-2.16
6.00	-1.75	-0.25	-1.75	-1.3408427	2.22	-1.924	-1.98
7.00	-1.44	0.03	-1.44	-1.0087113	2.36	-1.5959	-1.54
8.00	-1.14	0.25	-1.14	-0.7309626	2.68	-1.3164	-1.24
9.00	-0.83	0.39	-0.83	-0.4665901	2.75	-1.0266	-1.03
10.00	-0.59	0.55	-0.59	-0.202214	2.98	-0.7734	-0.74
11.00	-0.34	0.85	-0.34	0.0435773	3.06	-0.5143	-0.53
12.00	-0.09	1.02	-0.09	0.2358934	3.24	-0.3098	-0.32
13.00	0.12	1.19	0.12	0.4531416	3.50	-0.094	-0.27
14.00	0.30	1.45	0.30	0.6528146	3.59	0.1164	0.22
15.00	0.52	1.68	0.52	0.838931	3.63	0.3031	0.36
16.00	0.70	1.87	0.70	1.0388124	3.73	0.4796	0.49
17.00	0.89	2.06	0.89	1.2224084	3.82	0.6612	0.63
18.00	1.04	2.29	1.04	1.4061621	3.89	0.8402	0.93
19.00	1.22	2.43	1.22	1.5843016	3.99	1.01	0.96
20.00	1.38	2.61	1.38	1.734127	4.14	1.1749	1.21
21.00	1.53	2.68	1.53	1.8960226	4.27	1.3375	1.37
22.00	1.68	2.76	1.68	2.082005	4.37	1.4945	1.50
23.00	1.84	2.88	1.84	2.2436967	4.43	1.6459	1.65
24.00	1.99	3.01	1.99	2.4242501	4.59	1.7825	1.76
25.00	2.14	3.09	2.14	2.6026993	4.76	1.922	1.87
26.00	2.30	3.17	2.30	2.7595692	4.82	2.052	2.03
27.00	2.42	3.31	2.42	2.9082451	4.90	2.1796	2.20
28.00	2.57	3.41	2.57	3.0363336	4.96	2.3162	2.37
29.00	2.70	3.53	2.70	3.1750863	5.01	2.4363	2.26
30.00	2.82	3.65	2.82	3.3214738	5.10	2.569	2.63
31.00	2.97	3.71	2.97	3.474546	5.19	2.6857	2.83
32.00	3.09	3.77	3.09	3.6224127	5.26	2.804	2.90
33.00	3.22	3.86	3.22	3.766655	5.36	2.9235	2.75
34.00	3.34	3.98	3.34	3.8988538	5.39	3.0515	2.93
35.00	3.46	4.09	3.46	4.0333433	5.45	3.17	3.24
36.00	3.58	4.16	3.58	4.1580658	5.55	3.2866	3.36
37.00	3.71	4.29	3.71	4.2819891	5.65	3.3956	3.32
38.00	3.83	4.36	3.83	4.4130554	5.69	3.5163	3.34
39.00	3.95	4.45	3.95	4.5299482	5.75	3.633	3.74
40.00	4.08	4.59	4.08	4.6816735	5.79	3.7503	3.88
41.00	4.20	4.63	4.20	4.8053803	5.85	3.8729	3.77
42.00	4.32	4.73	4.32	4.943243	5.95	3.9969	3.90
43.00	4.41	4.82	4.41	5.0709457	5.98	4.1183	3.99
44.00	4.54	4.88	4.54	5.1985793	6.03	4.2356	4.17
45.00	4.66	4.95	4.66	5.3228908	6.08	4.3468	4.14
46.00	4.78	5.06	4.78	5.4351501	6.16	4.4628	4.54
47.00	4.90	5.14	4.90	5.5696669	6.19	4.5752	4.79
48.00	5.00	5.27	5.00	5.7016563	6.24	4.6968	4.63
49.00	5.12	5.38	5.12	5.8338289	6.29	4.8077	4.81
50.00	5.24	5.46	5.24	5.9563456	6.34	4.9287	4.77
51.00	5.36	5.49	5.36	6.0778708	6.48	5.0406	4.90
52.00	5.49	5.59	5.49	6.1971216	6.56	5.1618	5.28
53.00	5.58	5.71	5.58	6.327774	6.64	5.2789	5.23
54.00	5.70	5.79	5.70	6.4671364	6.75	5.3968	5.52
55.00	5.82	5.88	5.82	6.5927496	6.80	5.5056	5.59
56.00	5.95	5.92	5.95	6.7178383	6.87	5.6228	5.61
57.00	6.04	5.98	6.04	6.8256364	6.98	5.747	6.08
58.00	6.16	6.05	6.16	6.9617524	7.06	5.8632	5.78
59.00	6.28	6.14	6.28	7.0987906	7.12	5.9867	6.09
60.00	6.37	6.23	6.37	7.2211533	7.17	6.1095	5.99
61.00	6.50	6.33	6.50	7.3370018	7.23	6.2261	6.36
62.00	6.62	6.41	6.62	7.4583941	7.28	6.342	6.47
63.00	6.74	6.48	6.74	7.582478	7.33	6.4718	6.53
64.00	6.83	6.55	6.83	7.7256298	7.39	6.5875	6.55
65.00	6.96	6.64	6.96	7.853271	7.48	6.7119	6.77
66.00	7.08	6.72	7.08	7.9845886	7.59	6.8378	6.86
67.00	7.20	6.84	7.20	8.1083755	7.64	6.9569	7.11
68.00	7.29	6.94	7.29	8.2632217	7.73	7.075	7.00
69.00	7.42	7.02	7.42	8.3952236	7.77	7.1922	7.22
70.00	7.54	7.11	7.54	8.5222254	7.86	7.3086	7.43
71.00	7.66	7.24	7.66	8.6643419	7.91	7.4269	7.44
72.00	7.79	7.39	7.79	8.791172	7.98	7.5556	7.45
73.00	7.91	7.49	7.91	8.9456482	8.03	7.6822	7.80
74.00	8.03	7.64	8.03	9.0763311	8.08	7.8101	7.70
75.00	8.15	7.74	8.15	9.2108192	8.20	7.9448	8.05
76.00	8.28	7.83	8.28	9.3720093	8.32	8.0735	8.22
77.00	8.40	7.91	8.40	9.51511	8.39	8.2131	8.08
78.00	8.52	8.01	8.52	9.6770573	8.44	8.3513	8.23
79.00	8.64	8.15	8.64	9.8211098	8.52	8.4972	8.74
80.00	8.80	8.26	8.80	9.9778347	8.70	8.6338	8.71
81.00	8.92	8.37	8.92	10.1325569	8.76	8.7803	8.73
82.00	9.04	8.47	9.04	10.2954702	8.87	8.9273	8.68
83.00	9.20	8.58	9.20	10.4582977	8.93	9.0754	9.12
84.00	9.35	8.69	9.35	10.6305885	9.04	9.222	9.14
85.00	9.50	8.83	9.50	10.8036671	9.07	9.3751	9.51
86.00	9.66	8.96	9.66	11.0096073	9.16	9.5361	9.45
87.00	9.81	9.17	9.81	11.187212	9.21	9.713	9.73
88.00	9.96	9.32	9.96	11.4011726	9.33	9.8867	9.88
89.00	10.15	9.49	10.15	11.6025372	9.41	10.0739	10.05
90.00	10.30	9.67	10.30	11.8271999	9.50	10.2812	10.21
91.00	10.51	9.83	10.51	12.0810299	9.67	10.4819	10.48
92.00	10.70	9.93	10.70	12.321373	9.74	10.7125	10.61
93.00	10.91	10.12	10.91	12.6109695	9.86	10.949	10.95
94.00	11.16	10.30	11.16	12.874567	10.04	11.2149	11.27
95.00	11.43	10.58	11.43	13.2078075	10.27	11.4945	11.50
96.00	11.71	10.78	11.71	13.6228771	10.56	11.8167	11.82
97.00	12.08	11.02	12.08	14.0414963	10.73	12.2251	12.19
98.00	12.54	11.49	12.54	14.6611309	11.09	12.8086	12.68
99.00	13.24	12.55	13.24	15.5756531	12.66	13.7911	13.93
100.00	16.79	15.47	16.56	20.7456455	13.00	23.3504	23.40

	Config		Company1	Company2	Company3	Company4	Company5	Company6	Company7
Uplink Mobility spectral efficiency	InH-NLos-4	FDD	3.09	2	2.71	2.62	2.62	2.58	2.3
		TDD	2.88		2.62		2.60	2.43	
		Requirement	1	1	1	1	1	1	1
	UMi-NLos-4	FDD	1.26	1.20	1.38	1.11	1.16	0.98	1.40
		TDD	1.18		1.33		1.12	0.91	
		Requirement	0.75	0.75	0.75	0.75	0.75	0.75	0.75
	UMa-NLos-4	FDD	0.99	1.30	1.13	0.96	1.10	0.75	1.30
		TDD	0.92		1.09		1.08	0.71	
		Requirement	0.55	0.55	0.55	0.55	0.55	0.55	0.55
	RMa-NLos-4	FDD	1.05	1.40	1.15	1.28	1.19	0.94	1.50
		TDD	0.98		1.11		1.16	0.88	
		Requirement	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Uplink Mobility spectral efficiency	InH-NLos-8	FDD	3.24			3.52			
		TDD	3.02				3.07	2.79	
		Requirement	1	1	1	1	1	1	1
	UMi-NLos-8	FDD	1.54			1.40			
		TDD	1.43				1.58	1.12	
		Requirement	0.75	0.75	0.75	0.75	0.75	0.75	0.75
	UMa-NLos-8	FDD	1.24			1.36			
		TDD	1.14				1.66	1.02	
		Requirement	0.55	0.55	0.55	0.55	0.55	0.55	0.55
	RMa-NLos-8	FDD	1.30			1.42			
		TDD	1.20				1.51	1.11	
		Requirement	0.25	0.25	0.25	0.25	0.25	0.25	0.25

			Company1	Company4	Company5	Company6
InH-Los-4		FDD	3.38	2.9484	3.06	3.21
		TDD	3.14			3.07
		Requirement	1	1	1	1
UMi-Los-4		FDD	1.67	1.2257	1.28	1.50
		TDD	1.55			1.41
		Requirement	0.75	0.75	0.75	0.75
UMa-Los-4		FDD	1.56	1.3391	1.23	1.32
		TDD	1.44			1.27
		Requirement	0.55	0.55	0.55	0.55
RMa-Los-4		FDD	1.65	1.521	1.31	1.31
		TDD	1.53			1.23
		Requirement	0.25	0.25	0.25	0.25
InH-Los-8		FDD	3.41	3.64		
		TDD	3.16		3.24	3.11
		Requirement	1	1	1	1
UMi-Los-8		FDD	1.83	1.46		
		TDD	1.69		1.65	1.49
		Requirement	0.75	0.75	0.75	0.75
UMa-Los-8		FDD	1.57	1.55		
		TDD	1.46		1.71	1.33
		Requirement	0.55	0.55	0.55	0.55
RMa-Los-8		FDD	1.70	1.66		
		TDD	1.58		1.68	1.27
		Requirement	0.25	0.25	0.25	0.25

VoIP Evaluation

	Parameter	General Values used for evaluation (R1-092967, R1-092952)	Company1	Company2	Company3	Company4	Company5	Company6	Company7
VoIP General	Deployment scenario	• Indoor hotspot • Urban micro-cell • Urban macro-cell • Rural macro-cell Parameters and assumptions not shown here for each scenario are shown in ITU guidelines [ITU-R Report M.2135].	Aligned with guidelines	Aligned with guidelines	Aligned with guidelines	Aligned	Aligned with guidelines	Aligned with guidelines	Align with the assumption
	Duplex method and bandwidths	FDD: 10+10 MHz except Indoor hotspot with 20+20 MHz TDD: 20 MHz Baseline asymmetry during 5 subframes period: 2 full DL subframes, Special subframe: DwPTS 11symbol, GP 1 symbol, UpPTS 2 symbol, 2 full UL subframes Alternative special subframe configurations may be used if stated.	Aligned with guidelines VoIP FDD: 5+5MHz VoIP TDD:10MHz	Aligned with guidelines VoIP FDD: 5+5MHz VoIP TDD:10MHz	Aligned with guidelines VoIP FDD: 5+5MHz VoIP TDD:10MHz	FDD 5MHz + 5MHz TDD: 5 MHz	Aligned with guidelines VoIP FDD: 5+5MHz VoIP TDD:10MHz	Aligned with guidelines VoIP FDD: 5+5MHz VoIP TDD:10MHz	FDD: 5MHz+5MHz TDD: 10MHz
	Network synchronization	Synchronized	Synchronized	Synchronized	Synchronized	Synchronised	Synchronized	Synchronized	Synchronized
	Handover margin	1.0 dB	1.0 dB	1.0 dB	1.0 dB	1.0dB	1.0 dB	1.0 dB	1.0dB
	Downlink HARQ scheme	Incremental redundancy or Chase combining	CC	HARQ-CC, re-transmission times is limited by 50ms latency requirement.		CC	CC	IR	Chase combining
	Uplink scheduler	Channel dependent	Semi-persistent	Semi-persistent	Semi-persistent	Semi-persistent	Semi-persistent	Semi-persistent	Semi-persistent
	Uplink HARQ scheme	Incremental redundancy or Chase combining	CC	HARQ-CC, re-transmission times is limited by 50ms latency requirement.	CC	CC	CC	IR	Incremental redundancy
	Uplink receiver type	MMSE or MMSE-SIC (MU-MIMO)	MMSE	MMSE	MMSE	MMSE	MMSE	MMSE	MMSE
	Antenna configuration base station	Baseline: 4 or 8 Tx antennas with the following configurations: A) Uncorrelated co-polarized: Co-polarized antennas separated 4 wavelengths (illustration for 4 Tx: | | | |) B) Grouped co-polarized: Two groups of co-polarized antennas. 10 wavelengths between center of each group. 0.5 wavelength separation within each group (illustration for 4 Tx: || ||) C) Correlated: co-polarized: 0.5 wavelengths between antennas (illustration for 4 Tx: |||) D) Uncorrelated cross-polarized: Columns with +-45deg linearly polarized antennas Columns separated 4 wavelengths (illustration for 4 Tx: X X) E) Correlated cross-polarized Columns with +-45deg linearly polarized antennas Columns separated 0.5 wavelengths (illustration for 8Tx: XXXX) Baseline mappings between deployment scenario and antenna configurations: For downlink: • Indoor Hotspot: A (Rel.8) • Urban Micro: C or E (MU-MIMO), B or E (CoMP, Rel.8) • Urban Macro: C or E (MU-MIMO), C or E (CoMP) • Rural Macro: C or E (MU-MIMO, Rel.8) Note: MU-MIMO = MU-MIMO with / without coordination CoMP = Joint processing CoMP For uplink: • Indoor Hotspot: A • Urban Micro: A or B or C or E	Antenna A and C in all the scenarioes, Antenna E for Outdoor scenarioes for TDD	Antenna C) in all the scenarioes, 4 antennas at eNB	Antenna A in all the scenarioes	UL : 4Rx (config. A), DL : 1Tx	UL : 1Tx_4Rx (config. C), MMSE DL : 1Tx_2Rx, MRC	Antenna C) in all the scenarioes, 4 antennas at eNB;	Antenna configuration A) for all scenarios
	Antenna configuration UE	Baseline: Vertically polarized antennas with 0.5 wavelengths separation at UE Alternative: Columns with linearly polarized orthogonal antennas with 0.5 wavelengths spacing between columns	Vertically	Vertically DL: 2 antennas at UE; UL: 1 antenna at UE	Vertically	UL : 1Tx, DL 2Rx	Vertically	Vertically; UL: 1Tx, DL 2Rx	Baseline with 2 Rx for DL and 1 Tx for UL
	Channel estimation (Uplink and downlink)	Recommended: Non-ideal (For non-ideal case, consider both estimation errors both for demodulation reference signals and sounding reference signals)	None-ideal	None-ideal	None-ideal	Non Ideal (SRS not used for UL)	None-ideal	None-ideal	Non-ideal
	Feedback and control channel errors	None	None	None	None	None	None	None	Fixed 1 % PDCCH BLEP assumed at receiver
	Number of base station antennas for VoIP	2-8 Baseline: 4	4 and 8	4	4	4 for UL, 1 for DL	4 for UL, 1 for DL	4	4
VoIP Special	PDDCH limitation for VoIP	Included, Exculded, Baseline: Included	Included	Included, 3 (2 for DwPTS) OFDM symbols for CCH	Included	8 PDCCH max for UL, 4 PDCCH max for DL	Included	Included	Included. FDD: 10 CCEs for UL scheduling and 10 CCEs for DL scheduling per DL subframe; TDD: 38 CCE in normal DL subframe for DL and UL scheduling, and 26 CCE in special subframe for DL and UL scheduling
	TDD configuration for VoIP	Configuration 0 and 1, DwPTS 12, GP 1, UpPTS 1	DL:UL = 3:2, DwPTS 12, GP 1, UpPTS 1	Config. 1 (DL:UL = 3:2), DwPTS 12, GP 1, UpPTS 1		TDD Config#1, DwPTS 12, GP 1, UpPTS 1	DL:UL = 3:2, DwPTS 12, GP 1, UpPTS 1	DL:UL = 3:2, DwPTS 12, GP 1, UpPTS 1	UL/DL configuration 1: [D S U U D] Special subframe: DwPTS 12 symbols, GP 1 symbol, UpPTS 1 symbol.
	VoIP Scheduler	Dynamic, Semi-persistent	Semi-persistent	Semi-persistent	Semi-persistent	FDD:Semi-persistent and Dynamic TDD: Dynamic only	Semi-persistent	Semi-persistent	Semi-persistent
Others	TDD active ratio		UL active ratio for TDD: (14+14+1)/(14+14+14+14+13), DL active ratio for TDD: (14+14+12)/(14+14+14+14+13), GP is not active for both UL and DL; SRS is active for UL	UL active ratio for TDD: (14+14+1)/(14+14+14+14+13), DL active ratio for TDD: (14+14+12)/(14+14+14+14+13), GP is not active for both UL and DL; SRS is active for UL			TDD:UL effective bandwidth=10MHz*(14+14+1)/(14+14+14+14+13), DL effective bandwidth=10MHz*(14+14+12)/(14+14+14+14+13), GP is not active for both UL and DL,SRS is active for UL	TDD:UL effective bandwidth=10MHz*(14+14+1)/(14+14+14+14+13), DL effective bandwidth=10MHz*(14+14+12)/(14+14+14+14+13), GP is not active for both UL and DL,SRS is active for UL	UL active ratio: 29/69; DL active ratio: 40/69.
	Power control		P0 and alpha is fitted by the scenarios based on the Average IoT <= 10dB	Alpha=0.8, P0 is fitted to the scenarios	P0 and alpha is fitted by the scenarios	Po = -111 dbm for Uma, Umi, Rma. Po = -111dBm for Indoor. Alpha = 1.0	P0 and alpha is fitted by the scenarios based on the Average IoT <= 10dB	Alpha=0.8, P0 is fitted to the scenarios	alpha is always 1.0; For IoT=10dB, P0 is -97 for InH; -104 for Umi and Uma: -102 for Rma.

VoIP

	Antenna A		Company 1	Company 4	Company 7
FDD VoIP	Indoor-FDD	UL	148	136	145
Capacity	Antenna A	DL	139	150	155
		Min	139	136	145
		Requirement	50	50	50
		IoT in UL	9.23	6.1	10
	Umi-FDD	UL	100	74	85
	Antenna A	DL	81	76	111
		Min	81	74	85
		Requirement	40	40	40
		IoT in UL	9.87	6.5	10
	Uma-FDD	UL	96	82	81
	Antenna A	DL	70	72	61
		Min	70	72	61
		Requirement	40	40	40
		IoT in UL	9.93	6.3	10
	Rma-FDD	UL	104	93	92
	Antenna A	DL	99	82	93
		Min	99	82	92
		Requirement	30	30	30
		IoT in UL	9.89	5.7	10

	Antenna A		Company 1	Company 7
TDD VoIP	Indoor-TDD	UL	139	136
Capacity	Antenna A	DL	138	155
		Min	138	136
		Requirement	50	50
		IoT in UL	9.29	10
	Umi-TDD	UL	96	67
	Antenna A	DL	80	110
		Min	80	67
		Requirement	40	40
		IoT in UL	9.92	10
	Uma-TDD	UL	90	64
	Antenna A	DL	69	60
		Min	69	60
		Requirement	40	40
		IoT in UL	9.88	10
	Rma-TDD	UL	99	74
	Antenna A	DL	98	88
		Min	98	74
		Requirement	30	30
		IoT in UL	9.79	10

	Antenna C		Company 1	Company2 (4 BS ant.)	Company3	Company6
	Indoor-FDD	UL	146	110	128	145
	Antenna C	DL	144	144	-	140
		Min	144	110	-	140
		Requirement	50	50	50	50
		IoT in UL	9.45		4.5	2.6
	Umi-FDD	UL	99	95	62	70
	Antenna C	DL	83	71	-	80
		Min	83	71	-	70
		Requirement	40	40	40	40
		IoT in UL	9.93		10.5	10
	Uma-FDD	UL	94	>85	68	65
	Antenna C	DL	72	70	-	80
		Min	72	70	-	65
		Requirement	40	40	40	40
		IoT in UL	9.96		10.2	10
	Rma-FDD	UL	103	>90	82	90
		DL	102	90	-	90
		Min	102	90	-	90
		Requirement	30	30	30	30
		IoT in UL	10.03		9.3	8

	Antenna C		Company 1	Company2 (4 BS ant.)	Company6
	Indoor -TDD	UL	138	118	135
	Antenna C	DL	142	147	135
		Min	138	118	135
		Requirement	50	50	50
		IoT in UL	9.55		2.6
	Umi-TDD	UL	94	70	70
	Antenna C	DL	82	>70	80
		Min	82	70	70
		Requirement	40	40	40
		IoT in UL	9.98		10
	Uma-TDD	UL	89	67	65
	Antenna C	DL	70	>70	70
		Min	70	67	65
		Requirement	40	40	40
		IoT in UL	9.26		10
	Rma-TDD	UL	97	88	90
	Antenna C	DL	100	>90	95
		Min	97	88	90
		Requirement	30	30	30
		IoT in UL	9.97		8

	Antenna E		Company 1	Company 2	Company 3	Company 4	Company 5
	Indoor-FDD	UL					
	Antenna E	DL					
		Min					
		Requirement	50	50	50	50	50
	Umi-FDD	UL					
	Antenna E	DL					
		Min					
		Requirement	40	40	40	40	40
	Uma-FDD	UL					
	Antenna E	DL					
		Min					
		Requirement	40	40	40	40	40
	Rma-FDD	UL					
	Antenna E	DL					
		Min					
		Requirement	30	30	30	30	30

	Antenna E		Company 1	Company 2	Company 3	Company 4	Company 5
	Indoor-TDD	UL					
	Antenna E	DL					
		Min					
		Requirement	50	50	50	50	50
		IoT in UL	9.21				
	Umi-TDD	UL	110				
	Antenna E	DL	96				
		Min	96				
		Requirement	40	40	40	40	40
		IoT in UL	10.08				
	Uma-TDD	UL	104				
	Antenna E	DL	82				
		Min	82				
		Requirement	40	40	40	40	40
		IoT in UL	9.69				
	Rma-TDD	UL	123				
	Antenna E	DL	109				
		Min	109				
		Requirement	30	30	30	30	30
		IoT in UL	9.97				